

SEQUENCE LISTING

<110> ANDERSEN, Peter
SKJOT, Rikke

<120> ~~NUCLEIC ACID FRAGMENTS AND POLYPEPTIDE FRAGMENTS~~
~~DERIVED FROM M. TUBERCULOSIS~~ *Antigens*

<130> 670001-2002. ⁴

<140> ~~09/246,191~~ *Here with*
<141> ~~1998-12-30~~

<150> ~~1997 01277/~~

<151> ~~1997-10-11~~

<150> ~~PCT/DK98/00438~~

<151> ~~1998-08-10~~

<150> ~~PCT/DK98/00132~~

<151> ~~1998-01-04~~

<150> ~~60/070,488~~

<151> ~~1998-01-05~~

<160> ~~199~~ *257*

<170> PatentIn Ver. 2.0

<210> 1

<211> 381

<212> DNA

<213> Mycobacterium tuberculosis

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<211> 96

<212> PRT

<213> Mycobacterium tuberculosis

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Gly Leu Asp Val Ser Asp Arg Ile Arg Val Val Met Ser Val Pro Ala
 50 55 60

Glu Arg Glu Asp Trp Ala Arg Thr His Arg Asp Leu Ile Ala Gly Glu
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Ile Leu Ala Thr Asp Phe Glu Phe Ala Asp Leu Ala Asp Gly Val Ala
 85 90 95

Ile Gly Asp Gly Val Arg Val Ser Ile Glu Lys Thr
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<210> 5

<211> 889

<212> DNA

<213> Mycobacterium tuberculosis

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<210> 6

<211> 162

<212> PRT

<213> Mycobacterium tuberculosis

<400> 6

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<210> 8

<211> 165

<212> PRT

<213> Mycobacterium tuberculosis

<400> 8

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Leu Pro Ala Val Gly Ser Pro Ala Pro Ala Phe Thr Leu Thr Gly Gly
 20 25 30

Asp Leu Gly Val Ile Ser Ser Asp Gln Phe Arg Gly Lys Ser Val Leu
 35 40 45

Leu Asn Ile Phe Pro Ser Val Asp Thr Pro Val Cys Ala Thr Ser Val
 50 55 60

Arg Thr Phe Asp Glu Arg Ala Ala Ala Ser Gly Ala Thr Val Leu Cys
 65 70 75 80

Val Ser Lys Asp Leu Pro Phe Ala Gln Lys Arg Phe Cys Gly Ala Glu
 85 90 95

Gly Thr Glu Asn Val Met Pro Ala Ser Ala Phe Arg Asp Ser Phe Gly
 100 105 110

Glu Asp Tyr Gly Val Thr Ile Ala Asp Gly Pro Met Ala Gly Leu Leu
 115 120 125

Ala Arg Ala Ile Val Val Ile Gly Ala Asp Gly Asn Val Ala Tyr Thr
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Ala Ala Leu Gly Ala
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<210> 9

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<212> DNA

<213> Mycobacterium tuberculosis

<400> 9

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<210> 10

<211> 217

<212> PRT

<213> Mycobacterium tuberculosis

<400> 10

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Asp Pro Cys Ser Asp Ile Ala Val Val Phe Ala Arg Gly Thr His Gln
  35              40              45

Ala Ser Gly Leu Gly Asp Val Gly Glu Ala Phe Val Asp Ser Leu Thr
  50              55              60

Ser Gln Val Gly Gly Arg Ser Ile Gly Val Tyr Ala Val Asn Tyr Pro
  65              70              75              80

Ala Ser Asp Asp Tyr Arg Ala Ser Ala Ser Asn Gly Ser Asp Asp Ala
  85              90              95

Ser Ala His Ile Gln Arg Thr Val Ala Ser Cys Pro Asn Thr Arg Ile
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Val Leu Gly Gly Tyr Ser Gln Gly Ala Thr Val Ile Asp Leu Ser Thr		
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130	135	140
Phe Gly Glu Pro Ser Ser Gly Phe Ser Ser Met Leu Trp Gly Gly Gly		
145	150	155
Ser Leu Pro Thr Ile Gly Pro Leu Tyr Ser Ser Lys Thr Ile Asn Leu		
165	170	175
Cys Ala Pro Asp Asp Pro Ile Cys Thr Gly Gly Gly Asn Ile Met Ala		
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His Val Ser Tyr Val Gln Ser Gly Met Thr Ser Gln Ala Ala Thr Phe		
195	200	205
Ala Ala Asn Arg Leu Asp His Ala Gly		
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<210> 11

<211> 949

<212> DNA

<213> Mycobacterium tuberculosis

<400> 11

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cgatggccaa cgccggtccg ggcaccaacg gtcacagtt tttcatcacc gtcggcaaga 600
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<210> 12

<211> 182

<212> PRT

<213> Mycobacterium tuberculosis

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Asn His Ala Pro Lys Thr Val Ala Asn Phe Val Gly Leu Ala Gln Gly
35 40 45

Thr Lys Asp Tyr Ser Thr Gln Asn Ala Ser Gly Gly Pro Ser Gly Pro
50 55 60

Phe Tyr Asp Gly Ala Val Phe His Arg Val Ile Gln Gly Phe Met Ile
65 70 75 80

Gln Gly Gly Asp Pro Thr Gly Thr Gly Arg Gly Gly Pro Gly Tyr Lys
85 90 95

Phe Ala Asp Glu Phe His Pro Glu Leu Gln Phe Asp Lys Pro Tyr Leu
100 105 110

Leu Ala Met Ala Asn Ala Gly Pro Gly Thr Asn Gly Ser Gln Phe Phe
115 120 125

Ile Thr Val Gly Lys Thr Pro His Leu Asn Arg Arg His Thr Ile Phe
130 135 140

Gly Glu Val Ile Asp Ala Glu Ser Gln Arg Val Val Glu Ala Ile Ser
145 150 155 160

Lys Thr Ala Thr Asp Gly Asn Asp Arg Pro Thr Asp Pro Val Val Ile
165 170 175

Glu Ser Ile Thr Ile Ser
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<210> 13

<211> 1060

<212> DNA

<213> Mycobacterium tuberculosis

<400> 13

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 gccccgacgc cgaagtgggtg ttcgcccgcg gccgcttcga accgcccggg attggcacgg 360
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 gcgcgccgt caccgacgtg gtactcgcgg tgcccaccca gatgtggggc ttcaccaatc 600
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 taaccgacca acgcgcgcac gatggagggg tccgtggtca tatcaagaca agaagggagt 960
 aggcgatgca cgcaaaagtc ggcgactacc tcgtggtgaa gggcacaacc acggaacggc 1020
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<212> PRT

<213> Mycobacterium tuberculosis

<400> 14

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Ala Cys Pro Asp Ala Glu Val Val Phe Ala Arg Gly Arg Phe Glu Pro
 35 40 45

Pro Gly Ile Gly Thr Val Gly Asn Ala Phe Val Ser Ala Leu Arg Ser
 50 55 60

Lys Val Asn Lys Asn Val Gly Val Tyr Ala Val Lys Tyr Pro Ala Asp
 65 70 75 80

Asn Gln Ile Asp Val Gly Ala Asn Asp Met Ser Ala His Ile Gln Ser
 85 90 95

Met Ala Asn Ser Cys Pro Asn Thr Arg Leu Val Pro Gly Gly Tyr Ser
 100 105 110

Leu Gly Ala Ala Val Thr Asp Val Val Leu Ala Val Pro Thr Gln Met
 115 120 125

Trp Gly Phe Thr Asn Pro Leu Pro Pro Gly Ser Asp Glu His Ile Ala
 130 135 140

Ala Val Ala Leu Phe Gly Asn Gly Ser Gln Trp Val Gly Pro Ile Thr
 145 150 155 160

Asn Phe Ser Pro Ala Tyr Asn Asp Arg Thr Ile Glu Leu Cys His Gly
 165 170 175

Asp Asp Pro Val Cys His Pro Ala Asp Pro Asn Thr Trp Glu Ala Asn
 180 185 190

Trp Pro Gln His Leu Ala Gly Ala Tyr Val Ser Ser Gly Met Val Asn
 195 200 205

Gln Ala Ala Asp Phe Val Ala Gly Lys Leu Gln
 210 215

<210> 15

<211> 1198

<212> DNA

<213> Mycobacterium tuberculosis

<400> 15

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<211> 265

<212> PRT

<213> Mycobacterium tuberculosis

<400> 16

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35 40 45

Ala Val Ser Thr Gly Arg Leu Ile Asp Val Lys Ala Pro Thr Asn Gly
50 55 60

Val Ile Ala His Leu Arg Ala Ser Lys Pro Leu Val Arg Leu Arg Val
65 70 75 80

Pro Phe Thr Leu Ser Arg Asn Glu Ile Asp Asp Val Glu Arg Gly Ser
85 90 95

Lys Asp Ser Asp Trp Glu Pro Val Lys Glu Ala Ala Lys Lys Leu Ala
100 105 110

Phe Val Glu Asp Arg Thr Ile Phe Glu Gly Tyr Ser Ala Ala Ser Ile
115 120 125

Glu Gly Ile Arg Ser Ala Ser Ser Asn Pro Ala Leu Thr Leu Pro Glu
130 135 140

Asp Pro Arg Glu Ile Pro Asp Val Ile Ser Gln Ala Leu Ser Glu Leu
145 150 155 160

Arg Leu Ala Gly Val Asp Gly Pro Tyr Ser Val Leu Leu Ser Ala Asp
165 170 175

Val Tyr Thr Lys Val Ser Glu Thr Ser Asp His Gly Tyr Pro Ile Arg
180 185 190

Glu His Leu Asn Arg Leu Val Asp Gly Asp Ile Ile Trp Ala Pro Ala
195 200 205

Ile Asp Gly Ala Phe Val Leu Thr Thr Arg Gly Gly Asp Phe Asp Leu
210 215 220

Gln Leu Gly Thr Asp Val Ala Ile Gly Tyr Ala Ser His Asp Thr Asp

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Ala Glu Ala Ser Val Ala Leu Ser His
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<210> 17
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<213> Mycobacterium tuberculosis

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<222> (13)
<223> Xaa is unknown

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<210> 18
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<213> Mycobacterium tuberculosis

<400> 18
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1 5 10 15

<210> 19
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<213> Mycobacterium tuberculosis

<220>
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<211> 15

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<213> Mycobacterium tuberculosis

<400> 20

Thr Asn Ser Pro Leu Ala Thr Ala Thr Ala Thr Leu His Thr Asn
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<210> 21

<211> 15

<212> PRT

<213> Mycobacterium tuberculosis

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<222> (10)
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<213> Mycobacterium tuberculosis

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Ala Glu Ile

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<213> Mycobacterium tuberculosis

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<210> 25
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<400> 25
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<210> 26

<211> 28
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 <213> Mycobacterium tuberculosis

<400> 26
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<210> 27
 <211> 32
 <212> DNA
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<400> 27
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 <213> Mycobacterium tuberculosis

<400> 28
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<400> 31
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<211> 24
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<210> 41
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 ggtggaagtg gcacgaccgg tgggtgcatg ccagcctgct ggcgcaaaac aacacccggg 720
 tgtgggtgtg gagcccgacc aacccgggag ccagcgatcc cgccgccatg atcggccaaa 780
 ccgcccaggc gatgggtaac agccgcagt tctacaacca gtatcgacgc gtcggcgggc 840
 acaacggaca cttcgacttc ccagccagcg gtgacaacgg ctgggggctcg tgggcgcccc 900
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<210> 42
 <211> 299

<212> PRT

<213> Mycobacterium tuberculosis

<400> 42

Met Lys Gly Arg Ser Ala Leu Leu Arg Ala Leu Trp Ile Ala Ala Leu
1 5 10 15

Ser Phe Gly Leu Gly Gly Val Ala Val Ala Ala Glu Pro Thr Ala Lys
20 25 30

Ala Ala Pro Tyr Glu Asn Leu Met Val Pro Ser Pro Ser Met Gly Arg
35 40 45

Asp Ile Pro Val Ala Phe Leu Ala Gly Gly Pro His Ala Val Tyr Leu
50 55 60

Leu Asp Ala Phe Asn Ala Gly Pro Asp Val Ser Asn Trp Val Thr Ala
65 70 75 80

Gly Asn Ala Met Asn Thr Leu Ala Gly Lys Gly Ile Ser Val Val Ala
85 90 95

Pro Ala Gly Gly Ala Tyr Ser Met Tyr Thr Asn Trp Glu Gln Asp Gly
100 105 110

Ser Lys Gln Trp Asp Thr Phe Leu Ser Ala Glu Leu Pro Asp Trp Leu
115 120 125

Ala Ala Asn Arg Gly Leu Ala Pro Gly Gly His Ala Ala Val Gly Ala
130 135 140

Ala Gln Gly Gly Tyr Gly Ala Met Ala Leu Ala Ala Phe His Pro Asp
145 150 155 160

Arg Phe Gly Phe Ala Gly Ser Met Ser Gly Phe Leu Tyr Pro Ser Asn
165 170 175

Thr Thr Thr Asn Gly Ala Ile Ala Ala Gly Met Gln Gln Phe Gly Gly
180 185 190

Val Asp Thr Asn Gly Met Trp Gly Ala Pro Gln Leu Gly Arg Trp Lys
195 200 205

Trp His Asp Pro Trp Val His Ala Ser Leu Leu Ala Gln Asn Asn Thr
210 215 220

Arg Val Trp Val Trp Ser Pro Thr Asn Pro Gly Ala Ser Asp Pro Ala
225 230 235 240

Ala Met Ile Gly Gln Thr Ala Glu Ala Met Gly Asn Ser Arg Met Phe
 245 250 255

Tyr Asn Gln Tyr Arg Ser Val Gly Gly His Asn Gly His Phe Asp Phe
 260 265 270

Pro Ala Ser Gly Asp Asn Gly Trp Gly Ser Trp Ala Pro Gln Leu Gly
 275 280 285

Ala Met Ser Gly Asp Ile Val Gly Ala Ile Arg
 290 295

<210> 43

<211> 27

<212> DNA

<213> Mycobacterium tuberculosis

<400> 43

gcaacacccg ggatgtcgca aatcatg

27

<210> 44

<211> 27

<212> DNA

<213> Mycobacterium tuberculosis

<400> 44

gtaacacccg gggtaggcgc cgacccg

27

<210> 45

<211> 37

<212> DNA

<213> Mycobacterium tuberculosis

<400> 45

ctactaagct tggatcccta gccgccccat ttggcgg

37

<210> 46

<211> 38

<212> DNA

<213> Mycobacterium tuberculosis

<400> 46

ctactaagct tccatgggtca ggtcttttcg atgcttac

38

<210> 47

<211> 450

<212> DNA

<213> Mycobacterium tuberculosis

<400> 47

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accagcagtc agcatacggc atggccgaaa agagtggggt gatgatggcc gaggatgttc 120
gcgccgagat cgtggccagc gttctcgaag tcgttgtcaa cgaaggcgat cagatcgaca 180
agggcgacgt cgtggtgctg ctggagtcga tgaagatgga gatccccgtc ctggccgaag 240
ctgccggaac ggtcagcaag gtggcggtat cgggtgggca tgcattcag gccggcgacc 300
ttatcgcggt gatcagctag tcgttgatag tcaactcatgt ccacactcgg tgatctgctc 360
gccgaacaca cgggtgtgcc gggcagcgcg gtggaccacc tgcattcggt ggtcggggag 420
tggcagctcc ttgccgactt gtcgtttgcc 450
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<210> 48

<211> 71

<212> PRT

<213> Mycobacterium tuberculosis

<400> 48

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Met Ala Glu Asp Val Arg Ala Glu Ile Val Ala Ser Val Leu Glu Val
  1              5              10             15

Val Val Asn Glu Gly Asp Gln Ile Asp Lys Gly Asp Val Val Val Leu
          20             25             30

Leu Glu Ser Met Lys Met Glu Ile Pro Val Leu Ala Glu Ala Ala Gly
          35             40             45

Thr Val Ser Lys Val Ala Val Ser Val Gly Asp Val Ile Gln Ala Gly
          50             55             60

Asp Leu Ile Ala Val Ile Ser
          65             70
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<210> 49

<211> 750

<212> DNA

<213> Mycobacterium tuberculosis

<400> 49

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gggtacccat cgatgggttg cggttcggca ccgaggtgct aacgcacttg ctgacacact 60
gctagtcgaa aacgaggcta gtcgcaacgt cgatcacacg agaggactga ccatgacaac 120
ttcaccgcgac ccgtatgccg cgctgcccac gctgccgtcc ttcagcctga cgtcaacctc 180
gatcaccgat gggcagccgc tggctacacc ccaggtcagc gggatcatgg gtgcggggcg 240
ggcggatgcc agtccgcagc tgaggtggtc gggatttccc agcgagaccc gcagcttcgc 300
ggtaaccgtc tacgacctg atgccccac cctgtccggg ttctggcact gggcggtggc 360
caacctgcct gccaacgtca ccgagttgcc cgaggggtgc ggcgatggcc gcgaactgcc 420
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gggcggggca ctgacattgg tcaacgacgc cggtatgcgc cggtatgtgg gtgcggcgcc 480
 gcctcccggg catgggggtgc atcgctacta cgtcgcggta cacgcgggtga aggtcgaaaa 540
 gctcgacctc cccgaggacg cgagtcctgc atatctggga ttcaacctgt tccagcacgc 600
 gattgcacga gcggtcatct tcggcaccta cgagcagcgt tagcgcttta gctggggtgc 660
 cgacgtcttg ccgagccgac cgcttcgtgc agcgagccga acccgccgtc atgcagcctg 720
 cgggcaatgc cttcatggat gtccttgccc 750

<210> 50

<211> 176

<212> PRT

<213> Mycobacterium tuberculosis

<400> 50

Met Thr Thr Ser Pro Asp Pro Tyr Ala Ala Leu Pro Lys Leu Pro Ser
 1 5 10 15

Phe Ser Leu Thr Ser Thr Ser Ile Thr Asp Gly Gln Pro Leu Ala Thr
 20 25 30

Pro Gln Val Ser Gly Ile Met Gly Ala Gly Gly Ala Asp Ala Ser Pro
 35 40 45

Gln Leu Arg Trp Ser Gly Phe Pro Ser Glu Thr Arg Ser Phe Ala Val
 50 55 60

Thr Val Tyr Asp Pro Asp Ala Pro Thr Leu Ser Gly Phe Trp His Trp
 65 70 75 80

Ala Val Ala Asn Leu Pro Ala Asn Val Thr Glu Leu Pro Glu Gly Val
 85 90 95

Gly Asp Gly Arg Glu Leu Pro Gly Gly Ala Leu Thr Leu Val Asn Asp
 100 105 110

Ala Gly Met Arg Arg Tyr Val Gly Ala Ala Pro Pro Pro Gly His Gly
 115 120 125

Val His Arg Tyr Tyr Val Ala Val His Ala Val Lys Val Glu Lys Leu
 130 135 140

Asp Leu Pro Glu Asp Ala Ser Pro Ala Tyr Leu Gly Phe Asn Leu Phe
 145 150 155 160

Gln His Ala Ile Ala Arg Ala Val Ile Phe Gly Thr Tyr Glu Gln Arg
 165 170 175

<210> 51
 <211> 800
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 51
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 ttacccccgc gctggcacca ccggcatcgg cgggctgccc ggatgccgag gtggtgttcg 180
 cccgcggaac cggcgaacca cctggcctcg gtcgggtagg ccaagctttc gtcagtccat 240
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 gcgcgtgccg ggccacgagg ttggtgctcg gcggctactc ccagggtgcg gccgtgatcg 420
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 cggacgatca catcgcccgcg atcgccctgt tcgggaatcc ctccgggccgc gctggcgggc 540
 tgatgagcgc cctgaccctt caattcgggt ccaagaccat caacctctgc aacaacggcg 600
 acccgatttg ttcggacggc aaccggtggc gagcgacact aggtacgtg cccgggatga 660
 ccaaccaggc ggcgcgtttc gtcgcgagca ggatctaacg cgagccgccc catagattcc 720
 ggctaagcaa cggctgcgcc gccgcccggc cagcagtgac cgccgccgac tggcacaccg 780
 cttaccacgg cttatgctg 800

<210> 52
 <211> 226
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 52
 Met Ile Pro Arg Pro Gln Pro His Ser Gly Arg Trp Arg Ala Gly Ala
 1 5 10 15
 Ala Arg Arg Leu Thr Ser Leu Val Ala Ala Ala Phe Ala Ala Ala Thr
 20 25 30
 Leu Leu Leu Thr Pro Ala Leu Ala Pro Pro Ala Ser Ala Gly Cys Pro
 35 40 45
 Asp Ala Glu Val Val Phe Ala Arg Gly Thr Gly Glu Pro Pro Gly Leu
 50 55 60
 Gly Arg Val Gly Gln Ala Phe Val Ser Ser Leu Arg Gln Gln Thr Asn
 65 70 75 80
 Lys Ser Ile Gly Thr Tyr Gly Val Asn Tyr Pro Ala Asn Gly Asp Phe
 85 90 95
 Leu Ala Ala Ala Asp Gly Ala Asn Asp Ala Ser Asp His Ile Gln Gln

100

105

110

Met Ala Ser Ala Cys Arg Ala Thr Arg Leu Val Leu Gly Gly Tyr Ser
 115 120 125

Gln Gly Ala Ala Val Ile Asp Ile Val Thr Ala Ala Pro Leu Pro Gly
 130 135 140

Leu Gly Phe Thr Gln Pro Leu Pro Pro Ala Ala Asp Asp His Ile Ala
 145 150 155 160

Ala Ile Ala Leu Phe Gly Asn Pro Ser Gly Arg Ala Gly Gly Leu Met
 165 170 175

Ser Ala Leu Thr Pro Gln Phe Gly Ser Lys Thr Ile Asn Leu Cys Asn
 180 185 190

Asn Gly Asp Pro Ile Cys Ser Asp Gly Asn Arg Trp Arg Ala His Leu
 195 200 205

Gly Tyr Val Pro Gly Met Thr Asn Gln Ala Ala Arg Phe Val Ala Ser
 210 215 220

Arg Ile
 225

<210> 53

<211> 700

<212> DNA

<213> Mycobacterium tuberculosis

<400> 53

ctaggaaagc ctttcctgag taagtattgc cttcgttgca taccgccctt tacctgcggt 60
 aatctgcatt ttatgacaga atacgaagg cctaagacaa aattccacgc gttaatgcag 120
 gaacagattc ataacgaatt cacagcggca caacaatatg tcgcgatcgc ggtttatttc 180
 gacagcgaag acctgccgca gttggcgaag catttttaca gccaaagcgt cgaggaacga 240
 aaccatgcaa tgatgctcgt gcaacacctg ctcgaccgcg accttcgtgt cgaaattccc 300
 ggcgtagaca cgggtgcgaaa ccagttcgac agaccccgcg aggcaactggc gctggcgctc 360
 gatcaggaac gcacagtcac cgaccaggtc ggtcggctga cagcgggtggc ccgcgacgag 420
 ggcgatttcc tcggcgagca gttcatgcag tggttcttgc aggaacagat cgaagaggtg 480
 gccttgatgg caaccctggt gcgggttgcc gatcggggccg gggccaaacct gttcgagcta 540
 gagaacttcg tcgcacgtga agtggatgtg gcgcccggcg catcaggcgc cccgcacgct 600
 gccggggggc gcctctagat ccttggcggg gatcagcgag tgggtcccgtt cgcccggccc 660
 tcttccagcc aggccttggt gcggccgggg tggtagtac 700

<210> 54

<211> 181

<212> PRT

<213> Mycobacterium tuberculosis

<400> 54

Met Thr Glu Tyr Glu Gly Pro Lys Thr Lys Phe His Ala Leu Met Gln
1 5 10 15

Glu Gln Ile His Asn Glu Phe Thr Ala Ala Gln Gln Tyr Val Ala Ile
20 25 30

Ala Val Tyr Phe Asp Ser Glu Asp Leu Pro Gln Leu Ala Lys His Phe
35 40 45

Tyr Ser Gln Ala Val Glu Glu Arg Asn His Ala Met Met Leu Val Gln
50 55 60

His Leu Leu Asp Arg Asp Leu Arg Val Glu Ile Pro Gly Val Asp Thr
65 70 75 80

Val Arg Asn Gln Phe Asp Arg Pro Arg Glu Ala Leu Ala Leu Ala Leu
85 90 95

Asp Gln Glu Arg Thr Val Thr Asp Gln Val Gly Arg Leu Thr Ala Val
100 105 110

Ala Arg Asp Glu Gly Asp Phe Leu Gly Glu Gln Phe Met Gln Trp Phe
115 120 125

Leu Gln Glu Gln Ile Glu Glu Val Ala Leu Met Ala Thr Leu Val Arg
130 135 140

Val Ala Asp Arg Ala Gly Ala Asn Leu Phe Glu Leu Glu Asn Phe Val
145 150 155 160

Ala Arg Glu Val Asp Val Ala Pro Ala Ala Ser Gly Ala Pro His Ala
165 170 175

Ala Gly Gly Arg Leu
180

<210> 55

<211> 950

<212> DNA

<213> Mycobacterium tuberculosis

<400> 55

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gacgcatgtt cttcaccgtc tatccacagc taccgacatt tgctccggct ggatcgcggg 120
 taaaattccg tcgtgaacaa tcgacccatc cgcttgcgta catccggcag ggctgggttg 180
 ggtgcggggc cattgatcac cgccgtcgtc ctgctcatcg ccttggggcg tgtttggacc 240
 ccggttgctt tcgccgatgg atgcccggac gccgaagtca cgttcgcccc cggcaccggc 300
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 gttccggttg gcagcatcag ctttggcagt ccgctacctg cggcatacgc agacaacgct 600
 gcagcggctc cgggtcttcg caatccgtcc aaccgcggcg gcggatcgct gtcgagcctg 660
 agcccgtat tcggttccaa ggcgattgac ctgtgcaatc ccaccgatcc gatctgccat 720
 gtggggcccc gcaacgaatt cagcggacac atcgacggct acataccac ctacaccacc 780
 caggcggcta gtttcgtcgt gcagaggctc cgcgccgggt cggtgccaca tctgcctgga 840
 tccgtcccg cagctgcccg gtctgtcctt cagatgcccg gcactgcccg accggctccc 900
 gaatcgctgc acggtcgtc acgctttgtc agtaagcca taaaatcgcg 950

<210> 56

<211> 262

<212> PRT

<213> Mycobacterium tuberculosis

<400> 56

Met Asn Asn Arg Pro Ile Arg Leu Leu Thr Ser Gly Arg Ala Gly Leu
 1 5 10 15

Gly Ala Gly Ala Leu Ile Thr Ala Val Val Leu Leu Ile Ala Leu Gly
 20 25 30

Ala Val Trp Thr Pro Val Ala Phe Ala Asp Gly Cys Pro Asp Ala Glu
 35 40 45

Val Thr Phe Ala Arg Gly Thr Gly Glu Pro Pro Gly Ile Gly Arg Val
 50 55 60

Gly Gln Ala Phe Val Asp Ser Leu Arg Gln Gln Thr Gly Met Glu Ile
 65 70 75 80

Gly Val Tyr Pro Val Asn Tyr Ala Ala Ser Arg Leu Gln Leu His Gly
 85 90 95

Gly Asp Gly Ala Asn Asp Ala Ile Ser His Ile Lys Ser Met Ala Ser
 100 105 110

Ser Cys Pro Asn Thr Lys Leu Val Leu Gly Gly Tyr Ser Gln Gly Ala
 115 120 125

Thr Val Ile Asp Ile Val Ala Gly Val Pro Leu Gly Ser Ile Ser Phe
 130 135 140

Gly Ser Pro Leu Pro Ala Ala Tyr Ala Asp Asn Val Ala Ala Val Ala
 145 150 155 160

Val Phe Gly Asn Pro Ser Asn Arg Ala Gly Gly Ser Leu Ser Ser Leu
 165 170 175

Ser Pro Leu Phe Gly Ser Lys Ala Ile Asp Leu Cys Asn Pro Thr Asp
 180 185 190

Pro Ile Cys His Val Gly Pro Gly Asn Glu Phe Ser Gly His Ile Asp
 195 200 205

Gly Tyr Ile Pro Thr Tyr Thr Thr Gln Ala Ala Ser Phe Val Val Gln
 210 215 220

Arg Leu Arg Ala Gly Ser Val Pro His Leu Pro Gly Ser Val Pro Gln
 225 230 235 240

Leu Pro Gly Ser Val Leu Gln Met Pro Gly Thr Ala Ala Pro Ala Pro
 245 250 255

Glu Ser Leu His Gly Arg
 260

<210> 57
 <211> 1000
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 57
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 tccattaatt cactctctgg aacacccgct gtagacctat cttctttcac tgacttcctg 180
 cgccgccagg cgccggagtt gctgccggca agcatcagcg gcggtgcgcc actcgcaggc 240
 ggcgatgcgc aactgccgca cggcaccacc attgtcgcgc tgaaataccc cggcggtgtt 300
 gtcattggcg gtagccggcg ttcgacgcag ggcaacatga tttctgggcg tgatgtgcgc 360
 aaggtgtata tcaccgatga ctacaccgct accggcatcg ctggcacggc tgcggtcgcg 420
 gttgagtttg cccggctgta tgccgtggaa cttgagcact acgagaagct cgagggtgtg 480
 ccgctgacgt ttgccggcaa aatcaaccgg ctggcgatta tgggtgcgtgg caatctggcg 540
 gccgcgatgc aggttctgct ggcgttgccg ttgctggcgg gctacgacat tcatgcgtct 600
 gacccgcaga gcgcgggtcg tatcgtttcg ttcgacgccg ccggcggttg gaacatcgag 660
 gaagaggggt atcaggcggt gggctcgggt tcgctgttcg cgaagtcgct gatgaagaag 720
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 gacgccgccg acgacgactc cgccaccggc ggtccggacc tgggtcgggg catctttccg 840
 acggcggtga tcatcgacgc cgacggggcg gttgacgtgc cggagagccg gattgccgaa 900
 ttggcccgcg cgatcatcga aagccgttcg ggtgcggata ctttcggctc cgatggcggt 960

gagaagtgag ttttccgtat ttcatctcgc ctgagcaggc

1000

<210> 58

<211> 291

<212> PRT

<213> Mycobacterium tuberculosis

<400> 58

Met Thr Trp Pro Leu Pro Asp Arg Leu Ser Ile Asn Ser Leu Ser Gly
1 5 10 15

Thr Pro Ala Val Asp Leu Ser Ser Phe Thr Asp Phe Leu Arg Arg Gln
20 25 30

Ala Pro Glu Leu Leu Pro Ala Ser Ile Ser Gly Gly Ala Pro Leu Ala
35 40 45

Gly Gly Asp Ala Gln Leu Pro His Gly Thr Thr Ile Val Ala Leu Lys
50 55 60

Tyr Pro Gly Gly Val Val Met Ala Gly Asp Arg Arg Ser Thr Gln Gly
65 70 75 80

Asn Met Ile Ser Gly Arg Asp Val Arg Lys Val Tyr Ile Thr Asp Asp
85 90 95

Tyr Thr Ala Thr Gly Ile Ala Gly Thr Ala Ala Val Ala Val Glu Phe
100 105 110

Ala Arg Leu Tyr Ala Val Glu Leu Glu His Tyr Glu Lys Leu Glu Gly
115 120 125

Val Pro Leu Thr Phe Ala Gly Lys Ile Asn Arg Leu Ala Ile Met Val
130 135 140

Arg Gly Asn Leu Ala Ala Ala Met Gln Gly Leu Leu Ala Leu Pro Leu
145 150 155 160

Leu Ala Gly Tyr Asp Ile His Ala Ser Asp Pro Gln Ser Ala Gly Arg
165 170 175

Ile Val Ser Phe Asp Ala Ala Gly Gly Trp Asn Ile Glu Glu Glu Gly
180 185 190

Tyr Gln Ala Val Gly Ser Gly Ser Leu Phe Ala Lys Ser Ser Met Lys
195 200 205

Lys Leu Tyr Ser Gln Val Thr Asp Gly Asp Ser Gly Leu Arg Val Ala

210 215 220
 Val Glu Ala Leu Tyr Asp Ala Ala Asp Asp Asp Ser Ala Thr Gly Gly
 225 230 235 240
 Pro Asp Leu Val Arg Gly Ile Phe Pro Thr Ala Val Ile Ile Asp Ala
 245 250 255
 Asp Gly Ala Val Asp Val Pro Glu Ser Arg Ile Ala Glu Leu Ala Arg
 260 265 270
 Ala Ile Ile Glu Ser Arg Ser Gly Ala Asp Thr Phe Gly Ser Asp Gly
 275 280 285
 Gly Glu Lys
 290

<210> 59
 <211> 900
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 59
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 tggcgcgtaa gggcattgcg cgggccaaaa gcgtggtggc gctggcctat gccgggtggtg 180
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 aggttgagtt gtgtgtggcc gaggtggcgc attacggcga gacgaaacgc cctgagttgt 480
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 acgccctgcg tatcgcggtc gctgcattgc gggccggcag tgccgacacc tcgggtggtg 660
 atcaaccac ccttggcgtg gccagcttag aggtggccgt tctcgatgcc aaccggccac 720
 ggcgcgcggt ccggcgcata accggctccg ccctgcaagc gttgctggtg gaccaggaaa 780
 gcccgagtc tgacggcgaa tcgtcgggct gagtccgaaa gtccgacgcg tgtctgggac 840
 cccgctgcga cgttaactgc gcctaaccac ggctcgacgc gtcgccggcc gtcctgactt 900

<210> 60
 <211> 248
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 60
 Met Ser Phe Pro Tyr Phe Ile Ser Pro Glu Gln Ala Met Arg Glu Arg
 1 5 10 15

Ser Glu Leu Ala Arg Lys Gly Ile Ala Arg Ala Lys Ser Val Val Ala
20 25 30

Leu Ala Tyr Ala Gly Gly Val Leu Phe Val Ala Glu Asn Pro Ser Arg
35 40 45

Ser Leu Gln Lys Ile Ser Glu Leu Tyr Asp Arg Val Gly Phe Ala Ala
50 55 60

Ala Gly Lys Phe Asn Glu Phe Asp Asn Leu Arg Arg Gly Gly Ile Gln
65 70 75 80

Phe Ala Asp Thr Arg Gly Tyr Ala Tyr Asp Arg Arg Asp Val Thr Gly
85 90 95

Arg Gln Leu Ala Asn Val Tyr Ala Gln Thr Leu Gly Thr Ile Phe Thr
100 105 110

Glu Gln Ala Lys Pro Tyr Glu Val Glu Leu Cys Val Ala Glu Val Ala
115 120 125

His Tyr Gly Glu Thr Lys Arg Pro Glu Leu Tyr Arg Ile Thr Tyr Asp
130 135 140

Gly Ser Ile Ala Asp Glu Pro His Phe Val Val Met Gly Gly Thr Thr
145 150 155 160

Glu Pro Ile Ala Asn Ala Leu Lys Glu Ser Tyr Ala Glu Asn Ala Ser
165 170 175

Leu Thr Asp Ala Leu Arg Ile Ala Val Ala Ala Leu Arg Ala Gly Ser
180 185 190

Ala Asp Thr Ser Gly Gly Asp Gln Pro Thr Leu Gly Val Ala Ser Leu
195 200 205

Glu Val Ala Val Leu Asp Ala Asn Arg Pro Arg Arg Ala Phe Arg Arg
210 215 220

Ile Thr Gly Ser Ala Leu Gln Ala Leu Leu Val Asp Gln Glu Ser Pro
225 230 235 240

Gln Ser Asp Gly Glu Ser Ser Gly
245

<210> 61

<211> 1560

<212> DNA

<213> Mycobacterium tuberculosis

<400> 61

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tctcggagcc ggtcccggcg ggtatgtcgc ggcgattcgc gccgcacagc tcggcctgag 180
cactgcaatc gtcgaacca agtactgggg cggagtatgc ctcaatgtcg gctgtatccc 240
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agagctgccg aaatcgatca ttattgccgg agctggtgcc attggcatgg agttcggcta 660
cgtgctgaag aactacggcg ttgacgtgac catcgtggaa ttccttcgcg gggcgctgcc 720
caacgaggac gccgatgtgt ccaaggagat cgagaagcag ttcaaaaagc tgggtgtcac 780
gatectgacc gccacgaagg tcgagtcgat cgccgatggc gggtcgcagg tcaccgtgac 840
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ggcgctgcag gagtgcttcc acggcctggt tggccacatg atcaatttct gagcggctca 1500
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```

<210> 62

<211> 464

<212> PRT

<213> Mycobacterium tuberculosis

<400> 62

```
Met Thr His Tyr Asp Val Val Val Leu Gly Ala Gly Pro Gly Gly Tyr
  1              5              10              15
```

```
Val Ala Ala Ile Arg Ala Ala Gln Leu Gly Leu Ser Thr Ala Ile Val
      20              25              30
```

```
Glu Pro Lys Tyr Trp Gly Gly Val Cys Leu Asn Val Gly Cys Ile Pro
      35              40              45
```

```
Ser Lys Ala Leu Leu Arg Asn Ala Glu Leu Val His Ile Phe Thr Lys
```

50	55	60
Asp Ala Lys Ala Phe Gly Ile Ser Gly Glu Val Thr Phe Asp Tyr Gly		
65	70	75 80
Ile Ala Tyr Asp Arg Ser Arg Lys Val Ala Glu Gly Arg Val Ala Gly		
	85	90 95
Val His Phe Leu Met Lys Lys Asn Lys Ile Thr Glu Ile His Gly Tyr		
	100	105 110
Gly Thr Phe Ala Asp Ala Asn Thr Leu Leu Val Asp Leu Asn Asp Gly		
	115	120 125
Gly Thr Glu Ser Val Thr Phe Asp Asn Ala Ile Ile Ala Thr Gly Ser		
	130	135 140
Ser Thr Arg Leu Val Pro Gly Thr Ser Leu Ser Ala Asn Val Val Thr		
145	150	155 160
Tyr Glu Glu Gln Ile Leu Ser Arg Glu Leu Pro Lys Ser Ile Ile Ile		
	165	170 175
Ala Gly Ala Gly Ala Ile Gly Met Glu Phe Gly Tyr Val Leu Lys Asn		
	180	185 190
Tyr Gly Val Asp Val Thr Ile Val Glu Phe Leu Pro Arg Ala Leu Pro		
	195	200 205
Asn Glu Asp Ala Asp Val Ser Lys Glu Ile Glu Lys Gln Phe Lys Lys		
	210	215 220
Leu Gly Val Thr Ile Leu Thr Ala Thr Lys Val Glu Ser Ile Ala Asp		
225	230	235 240
Gly Gly Ser Gln Val Thr Val Thr Val Thr Lys Asp Gly Val Ala Gln		
	245	250 255
Glu Leu Lys Ala Glu Lys Val Leu Gln Ala Ile Gly Phe Ala Pro Asn		
	260	265 270
Val Glu Gly Tyr Gly Leu Asp Lys Ala Gly Val Ala Leu Thr Asp Arg		
	275	280 285
Lys Ala Ile Gly Val Asp Asp Tyr Met Arg Thr Asn Val Gly His Ile		
	290	295 300
Tyr Ala Ile Gly Asp Val Asn Gly Leu Leu Gln Leu Ala His Val Ala		

305

310

315

320

Glu Ala Gln Gly Val Val Ala Ala Glu Thr Ile Ala Gly Ala Glu Thr
 325 330 335

Leu Thr Leu Gly Asp His Arg Met Leu Pro Arg Ala Thr Phe Cys Gln
 340 345 350

Pro Asn Val Ala Ser Phe Gly Leu Thr Glu Gln Gln Ala Arg Asn Glu
 355 360 365

Gly Tyr Asp Val Val Val Ala Lys Phe Pro Phe Thr Ala Asn Ala Lys
 370 375 380

Ala His Gly Val Gly Asp Pro Ser Gly Phe Val Lys Leu Val Ala Asp
 385 390 395 400

Ala Lys His Gly Glu Leu Leu Gly Gly His Leu Val Gly His Asp Val
 405 410 415

Ala Glu Leu Leu Pro Glu Leu Thr Leu Ala Gln Arg Trp Asp Leu Thr
 420 425 430

Ala Ser Glu Leu Ala Arg Asn Val His Thr His Pro Thr Met Ser Glu
 435 440 445

Ala Leu Gln Glu Cys Phe His Gly Leu Val Gly His Met Ile Asn Phe
 450 455 460

<210> 63

<211> 550

<212> DNA

<213> Mycobacterium tuberculosis

<400> 63

ggccccggctc gcggccgccc tgcaggaaaa gaaggcctgc ccaggcccag actcagccga 60
 gtagtcaccc agtaccaccc accaggaagg accgcccac atggcaaagc tctccaccga 120
 cgaactgctg gacgcgttca aggaaatgac cctgttggag ctctccgact tctgaagaa 180
 gttcgaggag accttcgagg tcaccgcccgc cgtccagtc gccgtcgccg ccgcccgggtgc 240
 cgccccggcc ggtgccgccc tcgaggctgc cgaggagcag tccgagttcg acgtgatcct 300
 tgaggccgcc ggcgacaaga agatcggcgt catcaagggtg gtccgggaga tcgtttccgg 360
 cctgggcctc aaggaggcca aggacctggt cgacggcgcg cccaagccgc tgctggagaa 420
 ggtcgccaag gaggccgccc acgaggccaa ggccaagctg gaggccgccc gcgccaccgt 480
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tgcgcccgt

550

<210> 64

<211> 130

<212> PRT

<213> Mycobacterium tuberculosis

<400> 64

Met Ala Lys Leu Ser Thr Asp Glu Leu Leu Asp Ala Phe Lys Glu Met
1 5 10 15

Thr Leu Leu Glu Leu Ser Asp Phe Val Lys Lys Phe Glu Glu Thr Phe
20 25 30

Glu Val Thr Ala Ala Ala Pro Val Ala Val Ala Ala Ala Gly Ala Ala
35 40 45

Pro Ala Gly Ala Ala Val Glu Ala Ala Glu Glu Gln Ser Glu Phe Asp
50 55 60

Val Ile Leu Glu Ala Ala Gly Asp Lys Lys Ile Gly Val Ile Lys Val
65 70 75 80

Val Arg Glu Ile Val Ser Gly Leu Gly Leu Lys Glu Ala Lys Asp Leu
85 90 95

Val Asp Gly Ala Pro Lys Pro Leu Leu Glu Lys Val Ala Lys Glu Ala
100 105 110

Ala Asp Glu Ala Lys Ala Lys Leu Glu Ala Ala Gly Ala Thr Val Thr
115 120 125

Val Lys
130

<210> 65

<211> 900

<212> DNA

<213> Mycobacterium tuberculosis

<400> 65

tgaacgccat cgggtccaac gaacgcagcg ctacctgatc accaccgggt ctgttagggc 60
tcttccccag gtcgtacagt cgggccatgg ccattgaggt ttcggtgttg cgggttttca 120
ccgattcaga cgggaatttc ggtaatccgc tgggggtgat caacgccagc aaggtcgaac 180
accgcgacag gcagcagctg gcagcccaat cgggctacag cgaaaccata ttcgtcgatc 240
ttcccagccc cggctcaacc accgcacacg ccaccatcca tactccccgc accgaaattc 300
cgttcgccgg acaccgacc gtgggagcgt cctggtggct gcgcgagagg gggacgccaa 360

ttaacacgct gcaggtgccg gccggcatcg tccaggtgag ctaccacggt gatctcaccg 420
 ccattcagcgc ccgctcggaa tgggcacccg agttcgccat ccacgacctg gattcacttg 480
 atgcgcttgc cgccgccgac cccgccgact ttccggacga catcgcgcac tacctctgga 540
 cctggaccga ccgctccgct ggctcgctgc gcgcccgcac gtttgccgcc aacttgggcg 600
 tcaccgaaga cgaagcgacc ggtgccgcgg ccatccggat taccgattac ctcagccgtg 660
 acctcaccat caccagggc aaaggatcgt tgatccacac cacctggagt cccgagggct 720
 ggggttcgggt agccggccga gttgtcagcg acggtgtggc acaactcgac tgacgtagag 780
 ctcagcgctg ccgatgcaac acggcgga ggtgatcctg caggggttgc ccgaccgcgc 840
 gcatctgcaa cgagtacgaa agctcgtcgc cgctgatgcg gtaggaacgg tcaagggcgg 900

<210> 66

<211> 228

<212> PRT

<213> Mycobacterium tuberculosis

<400> 66

Met Ala Ile Glu Val Ser Val Leu Arg Val Phe Thr Asp Ser Asp Gly
 1 5 10 15

Asn Phe Gly Asn Pro Leu Gly Val Ile Asn Ala Ser Lys Val Glu His
 20 25 30

Arg Asp Arg Gln Gln Leu Ala Ala Gln Ser Gly Tyr Ser Glu Thr Ile
 35 40 45

Phe Val Asp Leu Pro Ser Pro Gly Ser Thr Thr Ala His Ala Thr Ile
 50 55 60

His Thr Pro Arg Thr Glu Ile Pro Phe Ala Gly His Pro Thr Val Gly
 65 70 75 80

Ala Ser Trp Trp Leu Arg Glu Arg Gly Thr Pro Ile Asn Thr Leu Gln
 85 90 95

Val Pro Ala Gly Ile Val Gln Val Ser Tyr His Gly Asp Leu Thr Ala
 100 105 110

Ile Ser Ala Arg Ser Glu Trp Ala Pro Glu Phe Ala Ile His Asp Leu
 115 120 125

Asp Ser Leu Asp Ala Leu Ala Ala Asp Pro Ala Asp Phe Pro Asp
 130 135 140

Asp Ile Ala His Tyr Leu Trp Thr Trp Thr Asp Arg Ser Ala Gly Ser
 145 150 155 160

Leu Arg Ala Arg Met Phe Ala Ala Asn Leu Gly Val Thr Glu Asp Glu
 165 170 175

Ala Thr Gly Ala Ala Ala Ile Arg Ile Thr Asp Tyr Leu Ser Arg Asp
180 185 190

Leu Thr Ile Thr Gln Gly Lys Gly Ser Leu Ile His Thr Thr Trp Ser
195 200 205

Pro Glu Gly Trp Val Arg Val Ala Gly Arg Val Val Ser Asp Gly Val
210 215 220

Ala Gln Leu Asp
225

<210> 67

<211> 500

<212> DNA

<213> Mycobacterium tuberculosis

<400> 67

gtttgtggtg tcggtggtct ggggggcgcc aactgggatt cggttggggt ggggtgcaggt 60
ccggcgatgg gcatcggagg tgtgggtggt ttgggtgggg ccggttcggg tccggcgatg 120
ggcatggggg gtgtgggtgg tttgggtggg gccggttcgg gtccggcgat gggcatgggg 180
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cgctccgaca ggtcgtcgga cgtcgggggc ggagtctggc cgttgggctt cggtaggttt 360
gccgatgcgg gcgccggcgg aaacgaagca ctggggtcga agaacggctg cgctgccata 420
tcgtccggag cttccatacc ttcgtgcggc cggaagagct tgctgtagtc ggccgccatg 480
acaacctctc agagtgcgct 500

<210> 68

<211> 139

<212> PRT

<213> Mycobacterium tuberculosis

<400> 68

Met Gly Ala Gly Pro Ala Met Gly Ile Gly Gly Val Gly Gly Leu Gly
1 5 10 15

Gly Ala Gly Ser Gly Pro Ala Met Gly Met Gly Gly Val Gly Gly Leu
20 25 30

Gly Gly Ala Gly Ser Gly Pro Ala Met Gly Met Gly Gly Val Gly Gly
35 40 45

Leu Asp Ala Ala Gly Ser Gly Glu Gly Gly Ser Pro Ala Ala Ile Gly
50 55 60

Ile Gly Val Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
65 70 75 80

Ala Asp Thr Asn Arg Ser Asp Arg Ser Ser Asp Val Gly Gly Gly Val
85 90 95

Trp Pro Leu Gly Phe Gly Arg Phe Ala Asp Ala Gly Ala Gly Gly Asn
100 105 110

Glu Ala Leu Gly Ser Lys Asn Gly Cys Ala Ala Ile Ser Ser Gly Ala
115 120 125

Ser Ile Pro Ser Cys Gly Arg Lys Ser Leu Ser
130 135

<210> 69

<211> 2050

<212> DNA

<213> Mycobacterium tuberculosis

<400> 69

agcgactct gagaggttgt catggcggcc gactacgaca agctcttccg gccgcacgaa 60
ggatatggaag ctccggacga tatggcagcg cagccgttct tcgaccccag tgcttcgttt 120
ccgcggcgcc ccgcacggcg aaacctaccg aagcccaacg gccagactcc gcccccgacg 180
tccgacgacc tgtcggagcg gttcgtgtcg gccccggcgc cgccaccccc acccccacct 240
ccgcctccgc caactccgat gccgatcgcc gcaggagagc cgccctcgcc ggaaccggcc 300
gcatctaaac caccacaccc ccccatgccc atcgccggac ccgaaccggc cccacccaaa 360
ccaccacac ccccatgccc catcgccgga cccgaaccgg cccacccaa accaccaca 420
cctccgatgc ccatcgccgg acctgcaccc accccaaccg aatcccagtt ggcgcccccc 480
agaccaccga caccacaaac gccaacggga ggcgcgcagc aaccggaatc accggcgccc 540
cacgtaccct cgcacggggc acatcaaccc cggcgccacc caccagcacc gccctgggca 600
aagatgccaa tcggcgaacc cccgcccgtt cgttccagac cgtctgcgtc cccggccgaa 660
ccaccgaccc ggccctgccc ccaactctcc cgacgtgcgc gccggggcca ccgctatcgc 720
acagacaccg aacgaaacgt cgggaaggta gcaactggtc catccatcca ggcgcggtcg 780
cgggcagagg aagcatccgg cgcgcagctc gcccccgaa cggagccctc gccagcgccg 840
ttgggccaa cagatcgta tctggctccg cccaccgccc ccgcgcccac agaacctccc 900
cccagccct cgcgcagcg caactccggt cggcgtgccg agcgacgcgt ccaccccgat 960
ttagccgccc aacatgccgc ggcgcaacct gattcaatta cggccgcaac cactggcggt 1020
cgtcgcgcga agcgtgcagc gccgatctc gacgcgacac agaaatcctt aaggccggcg 1080
gccaaagggc cgaaggtgaa gaaggtgaag cccagaaaac cgaaggccac gaagccgccc 1140
aaagtgggtg cgcagcgccg ctggcgacat tgggtgcatg cgttgacgcg aatcaacctg 1200
ggcctgtcac ccgacgagaa gtacgagctg gacctgcacg ctcgagtcgg ccgcaatccc 1260
cgcgggctgt atcagatcgc cgtcgtcggt ctcaaagggt gggctggcaa aaccacgctg 1320
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gcggatccag gcgcgggaaa cctcgccgat cgggtagggc gacaatcggg cgcgaccatc 1440
gctgatgtgc ttgcagaaaa agagctgtcg cactacaacg acatccgcgc acacactagc 1500
gtcaatgcgg tcaatctgga agtgcgtgcc gcaccggaat acagctcggc gcagcgcgcg 1560

Ser His Gly Pro His Gln Pro Arg Arg Thr Ala Pro Ala Pro Pro Trp
 180 185 190

Ala Lys Met Pro Ile Gly Glu Pro Pro Pro Ala Pro Ser Arg Pro Ser
 195 200 205

Ala Ser Pro Ala Glu Pro Pro Thr Arg Pro Ala Pro Gln His Ser Arg
 210 215 220

Arg Ala Arg Arg Gly His Arg Tyr Arg Thr Asp Thr Glu Arg Asn Val
 225 230 235 240

Gly Lys Val Ala Thr Gly Pro Ser Ile Gln Ala Arg Leu Arg Ala Glu
 245 250 255

Glu Ala Ser Gly Ala Gln Leu Ala Pro Gly Thr Glu Pro Ser Pro Ala
 260 265 270

Pro Leu Gly Gln Pro Arg Ser Tyr Leu Ala Pro Pro Thr Arg Pro Ala
 275 280 285

Pro Thr Glu Pro Pro Pro Ser Pro Ser Pro Gln Arg Asn Ser Gly Arg
 290 295 300

Arg Ala Glu Arg Arg Val His Pro Asp Leu Ala Ala Gln His Ala Ala
 305 310 315 320

Ala Gln Pro Asp Ser Ile Thr Ala Ala Thr Thr Gly Gly Arg Arg Arg
 325 330 335

Lys Arg Ala Ala Pro Asp Leu Asp Ala Thr Gln Lys Ser Leu Arg Pro
 340 345 350

Ala Ala Lys Gly Pro Lys Val Lys Lys Val Lys Pro Gln Lys Pro Lys
 355 360 365

Ala Thr Lys Pro Pro Lys Val Val Ser Gln Arg Gly Trp Arg His Trp
 370 375 380

Val His Ala Leu Thr Arg Ile Asn Leu Gly Leu Ser Pro Asp Glu Lys
 385 390 395 400

Tyr Glu Leu Asp Leu His Ala Arg Val Arg Arg Asn Pro Arg Gly Ser
 405 410 415

Tyr Gln Ile Ala Val Val Gly Leu Lys Gly Gly Ala Gly Lys Thr Thr
 420 425 430

100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000

Leu Thr Ala Ala Leu Gly Ser Thr Leu Ala Gln Val Arg Ala Asp Arg
 435 440 445

Ile Leu Ala Leu Asp Ala Asp Pro Gly Ala Gly Asn Leu Ala Asp Arg
 450 455 460

Val Gly Arg Gln Ser Gly Ala Thr Ile Ala Asp Val Leu Ala Glu Lys
 465 470 475 480

Glu Leu Ser His Tyr Asn Asp Ile Arg Ala His Thr Ser Val Asn Ala
 485 490 495

Val Asn Leu Glu Val Leu Pro Ala Pro Glu Tyr Ser Ser Ala Gln Arg
 500 505 510

Ala Leu Ser Asp Ala Asp Trp His Phe Ile Ala Asp Pro Ala Ser Arg
 515 520 525

Phe Tyr Asn Leu Val Leu Ala Asp Cys Gly Ala Gly Phe Phe Asp Pro
 530 535 540

Leu Thr Arg Gly Val Leu Ser Thr Val Ser Gly Val Val Val Val Ala
 545 550 555 560

Ser Val Ser Ile Asp Gly Ala Gln Gln Ala Ser Val Ala Leu Asp Trp
 565 570 575

Leu Arg Asn Asn Gly Tyr Gln Asp Leu Ala Ser Arg Ala Cys Val Val
 580 585 590

Ile Asn His Ile Met Pro Gly Glu Pro Asn Val Ala Val Lys Asp Leu
 595 600 605

Val Arg His Phe Glu Gln Gln Val Gln Pro Gly Arg Val Val Val Met
 610 615 620

Pro Trp Asp Arg His Ile Ala Ala Gly Thr Glu Ile Ser Leu Asp Leu
 625 630 635 640

Leu Asp Pro Ile Tyr Lys Arg Lys Val Leu Glu Leu Ala Ala Ala Leu
 645 650 655

Ser Asp Asp Phe Glu Arg Ala Gly Arg Arg
 660 665

<210> 71

<211> 1890

<212> DNA

<213> Mycobacterium tuberculosis

<400> 71

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gcagcgatga ggaggagcgg cgccaacggc ccgcgccggc gacgatgcaa agcgcagcga 60
tgaggaggag cggcgcgcat gactgctgaa ccggaagtac ggacgctgcg cgaggttgtg 120
ctggaccagc tcggcactgc tgaatcgcg tgcgtacaaga tgtggctgcc gccgttgacc 180
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cggcaacggg aaaccacctt caaggaacac cgagtgggct cgatcgggat gtaccggcag 600
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ttcattgccg gtgtagcagg acccgagctc                                     1890
```

<210> 72

<211> 591

<212> PRT

<213> Mycobacterium tuberculosis

<400> 72

```
Met Thr Ala Glu Pro Glu Val Arg Thr Leu Arg Glu Val Val Leu Asp
1           5           10          15
```

```
Gln Leu Gly Thr Ala Glu Ser Arg Ala Tyr Lys Met Trp Leu Pro Pro
```

275	280	285
Arg Phe Asp Gly Val His Ser Ala Asp Asn Leu Val Glu Ala Ile Thr		
290	295	300
Ala Gly Val Thr Gln Ile Ala Ser Gln His Thr Glu Gln Ala Pro Pro		
305	310	315 320
Val Arg Val Leu Pro Glu Arg Ile His Leu His Glu Leu Asp Pro Asn		
325	330	335
Pro Pro Gly Pro Glu Ser Asp Tyr Arg Thr Arg Trp Glu Ile Pro Ile		
340	345	350
Gly Leu Arg Glu Thr Asp Leu Thr Pro Ala His Cys His Met His Thr		
355	360	365
Asn Pro His Leu Leu Ile Phe Gly Ala Ala Lys Ser Gly Lys Thr Thr		
370	375	380
Ile Ala His Ala Ile Ala Arg Ala Ile Cys Ala Arg Asn Ser Pro Gln		
385	390	395 400
Gln Val Arg Phe Met Leu Ala Asp Tyr Arg Ser Gly Leu Leu Asp Ala		
405	410	415
Val Pro Asp Thr His Leu Leu Gly Ala Gly Ala Ile Asn Arg Asn Ser		
420	425	430
Ala Ser Leu Asp Glu Ala Ala Gln Ala Leu Ala Val Asn Leu Lys Lys		
435	440	445
Arg Leu Pro Pro Thr Asp Leu Thr Thr Ala Gln Leu Arg Ser Arg Ser		
450	455	460
Trp Trp Ser Gly Phe Asp Val Val Leu Leu Val Asp Asp Trp His Met		
465	470	475 480
Ile Val Gly Ala Ala Gly Gly Met Pro Pro Met Ala Pro Leu Ala Pro		
485	490	495
Leu Leu Pro Ala Ala Ala Asp Ile Gly Leu His Ile Ile Val Thr Cys		
500	505	510
Gln Met Ser Gln Ala Tyr Lys Ala Thr Met Asp Lys Phe Val Gly Ala		
515	520	525
Ala Phe Gly Ser Gly Ala Pro Thr Met Phe Leu Ser Gly Glu Lys Gln		

530

535

540

Glu Phe Pro Ser Ser Glu Phe Lys Val Lys Arg Arg Pro Pro Gly Gln
 545 550 555 560

Ala Phe Leu Val Ser Pro Asp Gly Lys Glu Val Ile Gln Ala Pro Tyr
 565 570 575

Ile Glu Pro Pro Glu Glu Val Phe Ala Ala Pro Pro Ser Ala Gly
 580 585 590

<210> 73

<211> 15

<212> PRT

<213> Mycobacterium tuberculosis

<400> 73

Asp Pro Val Asp Asp Ala Phe Ile Ala Lys Leu Asn Thr Ala Gly
 1 5 10 15

<210> 74

<211> 14

<212> PRT

<213> Mycobacterium tuberculosis

<220>

<221> UNSURE

<222> (14)

<223> Xaa is unknown

<400> 74

Asp Pro Val Asp Ala Ile Ile Asn Leu Asp Asn Tyr Gly Xaa
 1 5 10

<210> 75

<211> 15

<212> PRT

<213> Mycobacterium tuberculosis

<220>

<221> UNSURE

<222> (5)

<223> Xaa is unknown

<400> 75

Ala	Glu	Met	Lys	Xaa	Phe	Lys	Asn	Ala	Ile	Val	Gln	Glu	Ile	Asp
1				5					10					15

<210> 76
 <211> 14
 <212> PRT
 <213> Mycobacterium tuberculosis

<220>
 <221> VARIANT
 <222> (3)
 <223> Ala is Ala or Gln

<220>
 <221> VARIANT
 <222> (7)
 <223> Thr is Gly or Thr

<220>
 <221> UNSURE
 <222> (11)
 <223> Xaa is unknown

<400> 76
Val Ile Ala Gly Met Val Thr His Ile His Xaa Val Ala Gly
1 5 10

<210> 77
 <211> 15
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 77
Thr Asn Ile Val Val Leu Ile Lys Gln Val Pro Asp Thr Trp Ser
1 5 10 15

<210> 78
 <211> 15
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 78
Ala Ile Glu Val Ser Val Leu Arg Val Phe Thr Asp Ser Asp Gly
1 5 10 15

<210> 79
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 79
Ala Lys Leu Ser Thr Asp Glu Leu Leu Asp Ala Phe Lys Glu Met
1 5 10 15

<210> 80
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<220>
<221> VARIANT
<222> (4)
<223> Asp is Asp or Glu

<400> 80
Asp Pro Ala Asp Ala Pro Asp Val Pro Thr Ala Ala Gln Leu Thr
1 5 10 15

<210> 81
<211> 50
<212> PRT
<213> Mycobacterium tuberculosis

<400> 81
Ala Glu Asp Val Arg Ala Glu Ile Val Ala Ser Val Leu Glu Val Val
1 5 10 15

Val Asn Glu Gly Asp Gln Ile Asp Lys Gly Asp Val Val Val Leu Leu
20 25 30

Glu Ser Met Tyr Met Glu Ile Pro Val Leu Ala Glu Ala Ala Gly Thr
35 40 45

Val Ser
50

<210> 82
<211> 15
<212> PRT

<213> Mycobacterium tuberculosis

<400> 82

Thr Thr Ser Pro Asp Pro Tyr Ala Ala Leu Pro Lys Leu Pro Ser
1 5 10 15

<210> 83

<211> 15

<212> PRT

<213> Mycobacterium tuberculosis

<400> 83

Thr Glu Tyr Glu Gly Pro Lys Thr Lys Phe His Ala Leu Met Gln
1 5 10 15

<210> 84

<211> 15

<212> PRT

<213> Mycobacterium tuberculosis

<400> 84

Thr Thr Ile Val Ala Leu Lys Tyr Pro Gly Gly Val Val Met Ala
1 5 10 15

<210> 85

<211> 15

<212> PRT

<213> Mycobacterium tuberculosis

<220>

<221> UNSURE

<222> (10)

<223> Xaa is unknown

<220>

<221> UNSURE

<222> (15)

<223> Xaa is unknown

<400> 85

Ser Phe Pro Tyr Phe Ile Ser Pro Glu Xaa Ala Met Arg Glu Xaa
1 5 10 15

<210> 86

<211> 15
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 86
 Thr His Tyr Asp Val Val Val Leu Gly Ala Gly Pro Gly Gly Tyr
 1 5 10 15

<210> 87
 <211> 450
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 87
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 acatgatccg atcgctgccg acattggcac gcaagtgcgc gacaacgctc tgcacggcgt 180
 gacggccggc tcgacggcgc tgacgtcggg gaccgggctg gttcccgcgg gggccgatga 240
 ggtctccgcc caagcggcga cggcggtcac atcggagggc atccaattgc tggcttccaa 300
 tgcacgggcc caagaccagc tccaccgtgc gggcgaagcg gtccaggacg tcgcccgcac 360
 ctattcgcaa atcgacgacg gcgcgcggcg cgtcttcgcc taataggccc ccaacacatc 420
 ggagggagtg atcaccatgc tgtggcacgc 450

<210> 88
 <211> 98
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 88
 Met Glu Lys Met Ser His Asp Pro Ile Ala Ala Asp Ile Gly Thr Gln
 1 5 10 15
 Val Ser Asp Asn Ala Leu His Gly Val Thr Ala Gly Ser Thr Ala Leu
 20 25 30
 Thr Ser Val Thr Gly Leu Val Pro Ala Gly Ala Asp Glu Val Ser Ala
 35 40 45
 Gln Ala Ala Thr Ala Phe Thr Ser Glu Gly Ile Gln Leu Leu Ala Ser
 50 55 60
 Asn Ala Ser Ala Gln Asp Gln Leu His Arg Ala Gly Glu Ala Val Gln
 65 70 75 80
 Asp Val Ala Arg Thr Tyr Ser Gln Ile Asp Asp Gly Ala Ala Gly Val
 85 90 95

Phe Ala

<210> 89

<211> 460

<212> DNA

<213> Mycobacterium tuberculosis

<400> 89

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agcggatggg tgcacagcgg actggtgccg agcaggccca tctgcgcggc ttcctcgtcg 180
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gggttcgtcg tgctctgggt cgcgcgggga tcaaggatcg acgccatcgg ctcgagcttc 420
tcgaaaagcg tgtaaccgc ggtctcggcc tggtagacct 460
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<210> 90

<211> 139

<212> PRT

<213> Mycobacterium tuberculosis

<400> 90

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Met Arg Val Asn Asp Pro Pro Ala Pro Gly Ser Asp Ser Ala Arg Ser
  1             5             10             15

Arg Pro Ala Pro Ala Leu Gly Pro Asp Pro Pro Ala Ser Gly Trp Phe
      20             25             30

Asp Ser Gly Leu Val Pro Ser Arg Pro Ile Cys Ala Ala Ser Ser Ser
      35             40             45

Ala Gly Leu Pro Pro Pro Val Pro Pro Thr Trp Leu Asn Asn Asp Val
      50             55             60

Thr Cys Cys Ser Gly Trp Val Ser Cys Cys Ile Gly Pro Leu Ile Ser
      65             70             75             80

Pro Ser Trp Pro Arg Val Trp Val Ala Ala Gly Gly Asn Trp Pro Thr
      85             90             95

Gly Val Glu Leu Pro Gly Glu Gly Ile Pro Lys Ile Gly Phe Val Val
      100            105            110

Leu Trp Leu Ala Pro Gly Ser Arg Ile Asp Ala Ile Gly Ser Ser Phe
      115            120            125
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Ser Lys Ser Val Leu Thr Ala Val Ser Ala Trp
130 135

<210> 91
<211> 1200
<212> DNA
<213> Mycobacterium tuberculosis

<400> 91
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gcgggatggc agacgctttc ggcggtctcg gacgtcagg ccgtcgagtt gaccgcgcgc 180
ctgaactctc tgggagaagc ctggactgga ggtggcagcg acaaggcgct tgcggctgca 240
acgccgatgg tggctctggc acaaaccgcg tcaacacagg ccaagaccgc tgcgatgcag 300
gcgacggcgc aagccgcggc atacaccag gccatggcca cgacgccgtc gctgccggag 360
atcgccgcca accacatcac ccaggcgcgc cttacggcca ccaacttctt cggatatcaac 420
acgatcccgga tcgcgttgac cgagatggat tatttcatcc gtatgtggaa ccaggcagcc 480
ctggcaatgg aggtctacca ggccgagacc gcggttaaca cgcttttcga gaagctcgag 540
ccgatggcgt cgatccttga tcccggcgcg agccagagca cgacgaaccg gatcttcgga 600
atgccctccc ctggcagctc aacaccggtt ggccagttgc cgccggcggc taccagagcc 660
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<210> 92
<211> 371
<212> PRT
<213> Mycobacterium tuberculosis

<400> 92
Met Ile Thr Met Leu Trp His Ala Met Pro Pro Glu Leu Asn Thr Ala
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Arg Leu Met Ala Gly Ala Gly Pro Ala Pro Met Leu Ala Ala Ala Ala
20 25 30
Gly Trp Gln Thr Leu Ser Ala Ala Leu Asp Ala Gln Ala Val Glu Leu
35 40 45
Thr Ala Arg Leu Asn Ser Leu Gly Glu Ala Trp Thr Gly Gly Gly Ser

50	55	60
Asp Lys Ala Leu Ala Ala Ala Thr Pro Met Val Val Trp Leu Gln Thr		
65	70	75 80
Ala Ser Thr Gln Ala Lys Thr Arg Ala Met Gln Ala Thr Ala Gln Ala		
85	90	95
Ala Ala Tyr Thr Gln Ala Met Ala Thr Thr Pro Ser Leu Pro Glu Ile		
100	105	110
Ala Ala Asn His Ile Thr Gln Ala Val Leu Thr Ala Thr Asn Phe Phe		
115	120	125
Gly Ile Asn Thr Ile Pro Ile Ala Leu Thr Glu Met Asp Tyr Phe Ile		
130	135	140
Arg Met Trp Asn Gln Ala Ala Leu Ala Met Glu Val Tyr Gln Ala Glu		
145	150	155 160
Thr Ala Val Asn Thr Leu Phe Glu Lys Leu Glu Pro Met Ala Ser Ile		
165	170	175
Leu Asp Pro Gly Ala Ser Gln Ser Thr Thr Asn Pro Ile Phe Gly Met		
180	185	190
Pro Ser Pro Gly Ser Ser Thr Pro Val Gly Gln Leu Pro Pro Ala Ala		
195	200	205
Thr Gln Thr Leu Gly Gln Leu Gly Glu Met Ser Gly Pro Met Gln Gln		
210	215	220
Leu Thr Gln Pro Leu Gln Gln Val Thr Ser Leu Phe Ser Gln Val Gly		
225	230	235 240
Gly Thr Gly Gly Gly Asn Pro Ala Asp Glu Glu Ala Ala Gln Met Gly		
245	250	255
Leu Leu Gly Thr Ser Pro Leu Ser Asn His Pro Leu Ala Gly Gly Ser		
260	265	270
Gly Pro Ser Ala Gly Ala Gly Leu Leu Arg Ala Glu Ser Leu Pro Gly		
275	280	285
Ala Gly Gly Ser Leu Thr Arg Thr Pro Leu Met Ser Gln Leu Ile Glu		
290	295	300
Lys Pro Val Ala Pro Ser Val Met Pro Ala Ala Ala Ala Gly Ser Ser		

305

310

315

320

Ala Thr Gly Gly Ala Ala Pro Val Gly Ala Gly Ala Met Gly Gln Gly
325 330 335

Ala Gln Ser Gly Gly Ser Thr Arg Pro Gly Leu Val Ala Pro Ala Pro
340 345 350

Leu Ala Gln Glu Arg Glu Glu Asp Asp Glu Asp Asp Trp Asp Glu Glu
355 360 365

Asp Asp Trp
370

<210> 93

<211> 1000

<212> DNA

<213> Mycobacterium tuberculosis

<400> 93

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tgggtgcatg	cgttgacgcg	aatcaacctg	ggcctgtcac	ccgacgagaa	gtacgagctg	180
gacctgcacg	ctcagagtccg	ccgcaatccc	cgcgggtcgt	atcagatcgc	cgtcgtcgg	240
ctcaaagggtg	gggctggcaa	aaccacgctg	acagcagcgt	tggggtcgac	gttggctcag	300
gtgcggggccg	accggatcct	ggctctagac	gcggatccag	gcgcgggaaa	cctcgccgat	360
cgggtagggc	gacaatcggg	cgcgaccatc	gctgatgtgc	ttgcagaaaa	agagctgtcg	420
cactacaacg	acatccgcgc	acacactagc	gtcaatgcgg	tcaatctgga	agtgtgccg	480
gcaccggaat	acagctcggc	gcagcgcgcg	ctcagcgacg	ccgactggca	tttcatcgcc	540
gatcctgcgt	cgaggtttta	caacctcgtc	ttggctgatt	gtggggccgg	cttcttcgac	600
ccgctgacct	gcggcgtgct	gtccacgggtg	tccggtgtcg	tggctcgtggc	aagtgtctca	660
atcgacggcg	cacaacaggc	gtcggtcgcg	ttggactggt	tgcgcaacaa	cggttaccaa	720
gatttggcga	gccgcgcatg	cgtggctcatc	aatcacatca	tgccggggaga	acccaatgtc	780
gcagttaaag	acctggtgcg	gcatttcgaa	cagcaagttc	aaccgcggccg	ggtcgtggtc	840
atgccgtggg	acaggcacat	tgcggccggga	accgagattt	cactcgactt	gctcgacctt	900
atctacaagc	gcaaggtcct	cgaattggcc	gcagcgctat	ccgacgattt	cgagaggggt	960
qqacgtcggt	gagcgcacct	gctgttgctg	ctggctctac			1000

<210> 94

<211> 308

<212> PRT

<213> Mycobacterium tuberculosis

<400> 94

Met Lys Lys Val Lys Pro Gln Lys Pro Lys Ala Thr Lys Pro Pro Lys
1 5 10 15

Val Val Ser Gln Arg Gly Trp Arg His Trp Val His Ala Leu Thr Arg
 20 25 30
 Ile Asn Leu Gly Leu Ser Pro Asp Glu Lys Tyr Glu Leu Asp Leu His
 35 40 45
 Ala Arg Val Arg Arg Asn Pro Arg Gly Ser Tyr Gln Ile Ala Val Val
 50 55 60
 Gly Leu Lys Gly Gly Ala Gly Lys Thr Thr Leu Thr Ala Ala Leu Gly
 65 70 75 80
 Ser Thr Leu Ala Gln Val Arg Ala Asp Arg Ile Leu Ala Leu Asp Ala
 85 90 95
 Asp Pro Gly Ala Gly Asn Leu Ala Asp Arg Val Gly Arg Gln Ser Gly
 100 105 110
 Ala Thr Ile Ala Asp Val Leu Ala Glu Lys Glu Leu Ser His Tyr Asn
 115 120 125
 Asp Ile Arg Ala His Thr Ser Val Asn Ala Val Asn Leu Glu Val Leu
 130 135 140
 Pro Ala Pro Glu Tyr Ser Ser Ala Gln Arg Ala Leu Ser Asp Ala Asp
 145 150 155 160
 Trp His Phe Ile Ala Asp Pro Ala Ser Arg Phe Tyr Asn Leu Val Leu
 165 170 175
 Ala Asp Cys Gly Ala Gly Phe Phe Asp Pro Leu Thr Arg Gly Val Leu
 180 185 190
 Ser Thr Val Ser Gly Val Val Val Val Ala Ser Val Ser Ile Asp Gly
 195 200 205
 Ala Gln Gln Ala Ser Val Ala Leu Asp Trp Leu Arg Asn Asn Gly Tyr
 210 215 220
 Gln Asp Leu Ala Ser Arg Ala Cys Val Val Ile Asn His Ile Met Pro
 225 230 235 240
 Gly Glu Pro Asn Val Ala Val Lys Asp Leu Val Arg His Phe Glu Gln
 245 250 255
 Gln Val Gln Pro Gly Arg Val Val Val Met Pro Trp Asp Arg His Ile
 260 265 270

Ala Ala Gly Thr Glu Ile Ser Leu Asp Leu Leu Asp Pro Ile Tyr Lys
 275 280 285

Arg Lys Val Leu Glu Leu Ala Ala Ala Leu Ser Asp Asp Phe Glu Arg
 290 295 300

Ala Gly Arg Arg
 305

<210> 95
 <211> 34
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 95
 aagagtagat ctatgatggc cgaggatggt cgcg

34

<210> 96
 <211> 27
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 96
 cggcgacgac ggatcctacc gcgtcgg

27

<210> 97
 <211> 28
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 97
 ccttgggaga tctttggacc ccggttgc

28

<210> 98
 <211> 25
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 98
 gacgagatct tatgggctta ctgac

25

<210> 99
 <211> 33
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 99

ccccccagat ctgcaccacc ggcatcggcg ggc

33

<210> 100

<211> 24

<212> DNA

<213> Mycobacterium tuberculosis

<400> 100

ggggcggatc cggtgcttag ccgg

24

<210> 101

<211> 32

<212> DNA

<213> Mycobacterium tuberculosis

<400> 101

ccggctgaga tctatgacag aatacgaagg gc

32

<210> 102

<211> 24

<212> DNA

<213> Mycobacterium tuberculosis

<400> 102

ccccgccagg gaactagagg cggc

24

<210> 103

<211> 38

<212> DNA

<213> Mycobacterium tuberculosis

<400> 103

ctgccgagat ctaccacat tgcgcgctg aaataccc

38

<210> 104

<211> 25

<212> DNA

<213> Mycobacterium tuberculosis

<400> 104

cgccatggcc ttacgcgcca actcg

25

<210> 105

<211> 32

<212> DNA

<213> Mycobacterium tuberculosis

<400> 105

ggcggagatc tgtgagtttt ccgtatttca tc

32

<210> 106

<211> 25

<212> DNA

<213> Mycobacterium tuberculosis

<400> 106

cgcgtcgagc catggttagg cgcag

25

<210> 107

<211> 32

<212> DNA

<213> Mycobacterium tuberculosis

<400> 107

gaggaagatc tatgacaact tcacccgacc cg

32

<210> 108

<211> 28

<212> DNA

<213> Mycobacterium tuberculosis

<400> 108

catgaagcca tggcccgag gctgcatg

28

<210> 109

<211> 33

<212> DNA

<213> Mycobacterium tuberculosis

<400> 109

ggcggagatc tgtgaccac tatgacgtcg tcg

33

<210> 110

<211> 36

<212> DNA

<213> Mycobacterium tuberculosis

<400> 110

ggcgcccatg gtcagaaatt gatcatgtgg ccaacc

36

<210> 111

<211> 33

<212> DNA

<213> Mycobacterium tuberculosis

<400> 111

ccgggagatc tatggcaaag ctctccaccg acg

33

<210> 112

<211> 32

<212> DNA

<213> Mycobacterium tuberculosis

<400> 112

cgctgggcag agctacttga cggtagcggg gg

32

<210> 113

<211> 36

<212> DNA

<213> Mycobacterium tuberculosis

<400> 113

ggcccagatc tatggccatt gaggtttcgg tgttgc

36

<210> 114

<211> 26

<212> DNA

<213> Mycobacterium tuberculosis

<400> 114

cgccgtgttg catggcagcg ctgagc

26

<210> 115

<211> 24

<212> DNA

<213> Mycobacterium tuberculosis

<400> 115

ggacgttcaa gcgacacatc gccg

24

<210> 116

<211> 24

<212> DNA

<213> Mycobacterium tuberculosis

<400> 116

cagcacgaac gcgccgtcga tggc

24

<210> 117

<211> 26

<212> DNA

<213> Mycobacterium tuberculosis

<400> 117

acagatctgt gacggacatg aacccg 26

<210> 118

<211> 28

<212> DNA

<213> Mycobacterium tuberculosis

<400> 118

ttttccatgg tcacggggcc cgggtact 28

<210> 119

<211> 26

<212> DNA

<213> Mycobacterium tuberculosis

<400> 119

acagatctgt gcccatggca cagata 26

<210> 120

<211> 27

<212> DNA

<213> Mycobacterium tuberculosis

<400> 120

tttaagcttc taggcgccc ggcgggc 27

<210> 121

<211> 26

<212> DNA

<213> Mycobacterium tuberculosis

<400> 121

acagatctgc gcatgcggat ccgtgt 26

<210> 122

<211> 28

<212> DNA

<213> Mycobacterium tuberculosis

<400> 122

ttttccatgg tcatccggcg tgatcgag 28

<210> 123

<211> 26

<212> DNA

<213> Mycobacterium tuberculosis

<400> 123

acagatctgt aatggcagac tgtgat 26

<210> 124

<211> 28

<212> DNA

<213> Mycobacterium tuberculosis

<400> 124

ttttccatgg tcaggagatg gtgatcga 28

<210> 125

<211> 26

<212> DNA

<213> Mycobacterium tuberculosis

<400> 125

acagatctgc cggctacccc ggtgcc 26

<210> 126

<211> 28

<212> DNA

<213> Mycobacterium tuberculosis

<400> 126

ttttccatgg ctattgcagc tttccggc 28

<210> 127

<211> 50

<212> PRT

<213> Mycobacterium tuberculosis

<400> 127

Ala Glu Asp Val Arg Ala Glu Ile Val Ala Ser Val Leu Glu Val Val
1 5 10 15

Val Asn Glu Gly Asp Gln Ile Asp Lys Gly Asp Val Val Val Leu Leu
20 25 30

Glu Ser Met Tyr Met Glu Ile Pro Val Leu Ala Glu Ala Ala Gly Thr
35 40 45

Val Ser
50

<210> 128

<211> 49

<212> PRT

<213> Mycobacterium tuberculosis

<400> 128

Ala Glu Asp Val Arg Ala Glu Ile Val Ala Ser Val Leu Glu Val Val
1 5 10 15

Val Asn Glu Gly Asp Gln Ile Asp Lys Gly Asp Val Val Val Leu Leu
20 25 30

Glu Ser Met Met Glu Ile Pro Val Leu Ala Glu Ala Ala Gly Thr Val
35 40 45

Ser

<210> 129

<211> 50

<212> PRT

<213> Mycobacterium tuberculosis

<400> 129

Ala Glu Asp Val Arg Ala Glu Ile Val Ala Ser Val Leu Glu Val Val
1 5 10 15

Val Asn Glu Gly Asp Gln Ile Asp Lys Gly Asp Val Val Val Leu Leu
20 25 30

Glu Ser Met Lys Met Glu Ile Pro Val Leu Ala Glu Ala Ala Gly Thr
35 40 45

Val Ser

50

<210> 130

<211> 33

<212> DNA

<213> Mycobacterium tuberculosis

<400> 130

ccgggagatc tatggcaaag ctctccaccg acg

33

<210> 131

<211> 32

<212> DNA

<213> Mycobacterium tuberculosis

<400> 131
cgctgggcag agctacttga cggtagcggg gg 32

<210> 132
<211> 36
<212> DNA
<213> Mycobacterium tuberculosis

<400> 132
ggcgccggca agcttgccat gacagagcag cagtgg 36

<210> 133
<211> 26
<212> DNA
<213> Mycobacterium tuberculosis

<400> 133
cgaactcgcc ggatcccgtg tttagc 26

<210> 134
<211> 32
<212> DNA
<213> Mycobacterium tuberculosis

<400> 134
ggcaaccgag agatctttct cccggccggg gc 32

<210> 135
<211> 27
<212> DNA
<213> Mycobacterium tuberculosis

<400> 135
ggcaagcttg ccggcgcta acgaact 27

<210> 136
<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 136
ggaccagat ctatgacaga gcagcagtgg 30

<210> 137
<211> 47
<212> DNA
<213> Mycobacterium tuberculosis

<400> 137

ccggcagccc cggccgggag aaaagctttg cgaacatccc agtgacg

47

<210> 138

<211> 44

<212> DNA

<213> Mycobacterium tuberculosis

<400> 138

gttcgcaaag cttttctccc ggccggggct gccggtcgag tacc

44

<210> 139

<211> 20

<212> DNA

<213> Mycobacterium tuberculosis

<400> 139

ccttcggtgg atcccgtcag

20

<210> 140

<211> 450

<212> DNA

<213> Mycobacterium tuberculosis

<400> 140

tggcgtgtc accgaggaac ctgtcaatgt cgtcgagcag tactgaaccg ttccgagaaa 60
ggccagcatg aacgtcaccg tatccattcc gaccatcctg cggccccaca ccggcggcca 120
gaagagtgtc tcggccagcg gcgatacctt gggtgccgtc atcagcgacc tggaggccaa 180
ctattcgggc atttccgagc gcctgatgga cccgtcttcc ccaggtaagt tgcaccgctt 240
cgtgaacatc tacgtcaacg acgaggacgt gcggttctcc ggcggttgg ccaccgcgat 300
cgctgacggg gactcgggtca ccatectccc cgccgtggcc ggtgggtgag cggagcacat 360
gacacgatac gactcgtgtg tgcaggcctt gggcaacacg ccgctggttg gcctgcagcg 420
attgtcgcca cgctgggatg acgggcgaga 450

<210> 141

<211> 93

<212> PRT

<213> Mycobacterium tuberculosis

<400> 141

Met Asn Val Thr Val Ser Ile Pro Thr Ile Leu Arg Pro His Thr Gly

1

5

10

15

Gly Gln Lys Ser Val Ser Ala Ser Gly Asp Thr Leu Gly Ala Val Ile

20

25

30

Ser Asp Leu Glu Ala Asn Tyr Ser Gly Ile Ser Glu Arg Leu Met Asp

35

40

45

Pro Ser Ser Pro Gly Lys Leu His Arg Phe Val Asn Ile Tyr Val Asn
 50 55 60

Asp Glu Asp Val Arg Phe Ser Gly Gly Leu Ala Thr Ala Ile Ala Asp
 65 70 75 80

Gly Asp Ser Val Thr Ile Leu Pro Ala Val Ala Gly Gly
 85 90

<210> 142

<211> 480

<212> DNA

<213> Mycobacterium tuberculosis

<400> 142

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 atgcggggaca tggcggggccg ttttgagggtg cacgcccaga cgggtggagga cgaggctcgc 180
 cggatgtggg cgtccgcgca aaacatctcg ggcgcgggct ggagtggcat ggccgaggcg 240
 acctcgctag acaccatggc ccagatgaat caggcggttc gcaacatcgt gaacatgctg 300
 cacgggggtgc gtgacgggct gggtcgcgac gccacaact acgagcagca agagcaggcc 360
 tcccagcaga tctcagcag ctaacgtcag ccgctgcagc acaatacttt tacaagcgaa 420
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<210> 143

<211> 98

<212> PRT

<213> Mycobacterium tuberculosis

<400> 143

Met Ala Thr Arg Phe Met Thr Asp Pro His Ala Met Arg Asp Met Ala
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Gly Arg Phe Glu Val His Ala Gln Thr Val Glu Asp Glu Ala Arg Arg
 20 25 30

Met Trp Ala Ser Ala Gln Asn Ile Ser Gly Ala Gly Trp Ser Gly Met
 35 40 45

Ala Glu Ala Thr Ser Leu Asp Thr Met Ala Gln Met Asn Gln Ala Phe
 50 55 60

Arg Asn Ile Val Asn Met Leu His Gly Val Arg Asp Gly Leu Val Arg
 65 70 75 80

Asp Ala Asn Asn Tyr Glu Gln Gln Glu Gln Ala Ser Gln Gln Ile Leu

Ser Ser

<210> 144

<211> 940

<212> DNA

<213> Mycobacterium tuberculosis

<400> 144

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gaactgggtc gaccttcaga ccaccgatca gtccgccgcc aaaaagttct acacatcggt 180
gttcggctgg ggttacgacg acaaccgggt ccccgagggc ggtggggtct attccatggc 240
cacgtgaac ggcgaagccg tggccgccat cgcaccgatg ccccggggtg caccggaggg 300
gatgccgccg atctggaaca cctatatcgc ggtggacgac gtcgatgcgg tggtaggaaa 360
ggtggtgccc gggggcgggc aggtgatgat gccggccctc gacatcggcg atgccggccg 420
gatgtcgctt atcaccgatc cgaccggcgc tgcctggggc ctatggcagg ccaatcgcca 480
catcggagcg acgttggtca acgagacggg cacgtctatc tggaaacgaac tgctcacgga 540
caagccggat ttggcgctag cgtttctacg ggtgtggtt ggccctaccc actcgagcat 600
ggagatagct gcggggccaga actatcgggg gctcaaggcc ggccgacgcg aagtcggcgg 660
ctgtatggaa ccgccgatgc ccggcgtgcc gaatcattgg cacgtctact ttgcgggtga 720
tgacgccgac gccacggcgg ccaaagccgc cgcagcgggc ggccaggcca ttgcggaacc 780
ggctgacatt ccgtcggtgg gccgggttcg cgtgttgtec gatccgcagg gcgcgatctt 840
cagtgtgttg aagcccgcac cgcagcaata gggagcatcc cgggcaggcc cgccggccgg 900
cagattcgga gaatgctaga agctgccgcc ggcgcgcgcc 940

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<210> 145

<211> 261

<212> PRT

<213> Mycobacterium tuberculosis

<400> 145

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Met Pro Lys Arg Ser Glu Tyr Arg Gln Gly Thr Pro Asn Trp Val Asp
  1           5           10           15

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```

Leu Gln Thr Thr Asp Gln Ser Ala Ala Lys Lys Phe Tyr Thr Ser Leu
      20           25           30

```

```

Phe Gly Trp Gly Tyr Asp Asp Asn Pro Val Pro Gly Gly Gly Gly Val
      35           40           45

```

```

Tyr Ser Met Ala Thr Leu Asn Gly Glu Ala Val Ala Ala Ile Ala Pro
      50           55           60

```

```

Met Pro Pro Gly Ala Pro Glu Gly Met Pro Pro Ile Trp Asn Thr Tyr

```

65	70	75	80
Ile Ala Val Asp Asp Val Asp Ala Val Val Asp Lys Val Val Pro Gly	85	90	95
Gly Gly Gln Val Met Met Pro Ala Phe Asp Ile Gly Asp Ala Gly Arg	100	105	110
Met Ser Phe Ile Thr Asp Pro Thr Gly Ala Ala Val Gly Leu Trp Gln	115	120	125
Ala Asn Arg His Ile Gly Ala Thr Leu Val Asn Glu Thr Gly Thr Leu	130	135	140
Ile Trp Asn Glu Leu Leu Thr Asp Lys Pro Asp Leu Ala Leu Ala Phe	145	150	155
Tyr Glu Ala Val Val Gly Leu Thr His Ser Ser Met Glu Ile Ala Ala	165	170	175
Gly Gln Asn Tyr Arg Val Leu Lys Ala Gly Asp Ala Glu Val Gly Gly	180	185	190
Cys Met Glu Pro Pro Met Pro Gly Val Pro Asn His Trp His Val Tyr	195	200	205
Phe Ala Val Asp Asp Ala Asp Ala Thr Ala Ala Lys Ala Ala Ala Ala	210	215	220
Gly Gly Gln Val Ile Ala Glu Pro Ala Asp Ile Pro Ser Val Gly Arg	225	230	235
Phe Ala Val Leu Ser Asp Pro Gln Gly Ala Ile Phe Ser Val Leu Lys	245	250	255
Pro Ala Pro Gln Gln	260		

<210> 146

<211> 280

<212> DNA

<213> Mycobacterium tuberculosis

<400> 146

ccgaaaggcg gtgcaccgca cccagaagaa aaggaaagat cgagaaatgc cacagggaac 60
 tgtgaagtgg ttcaacgcgg agaaggggtt cggctttatc gccccgaag acggttccgc 120
 ggatgtattt gtccactaca cggagatcca gggaacgggc ttccgcaccc ttgaagaaaa 180

ccagaagggtc gagttcgaga tcggccacag ccctaagggc ccccaggcca ccggagtccg 240
ctcgctctga gttacccccg cgagcagacg caaaaagccc 280

<210> 147

<211> 67

<212> PRT

<213> Mycobacterium tuberculosis

<400> 147

Met Pro Gln Gly Thr Val Lys Trp Phe Asn Ala Glu Lys Gly Phe Gly
1 5 10 15

Phe Ile Ala Pro Glu Asp Gly Ser Ala Asp Val Phe Val His Tyr Thr
20 25 30

Glu Ile Gln Gly Thr Gly Phe Arg Thr Leu Glu Glu Asn Gln Lys Val
35 40 45

Glu Phe Glu Ile Gly His Ser Pro Lys Gly Pro Gln Ala Thr Gly Val
50 55 60

Arg Ser Leu
65

<210> 148

<211> 540

<212> DNA

<213> Mycobacterium tuberculosis

<400> 148

atcgtgtcgt atcgagaacc ccggccggtg tcagaacgcg ccagagcgca aacctttata 60
acttcgtgtc ccaaagtga cgaccatgga ccaaggttcc tgagatgaac ctacggcgcc 120
atcagaccct gacgctgcga ctgctggcgg catccgcggg cattctcagc gccgcggcct 180
tcgcccgcgc agcacaggca aaccccgctc acgacgcgtt catcgccgcg ctgaacaatg 240
ccggcgtaaa ctacggcgat ccggtcgacg ccaaagcgct gggtcagtcc gtctgcccga 300
tcctggccga gcccggcggg tcgtttaaca ccgcggtagc cagcgttggt gcgcgcgccc 360
aaggcatgtc ccaggacatg gcgcaaactc tcaccagtat cgcgatttcg atgtactgcc 420
cctcgggtgat ggcagacgtc gccagcggca acctgccggc cctgccagac atgccggggc 480
tgccccgggtc ctaggcgtgc gcggctccta gccggtccct aacggatcga tcgtggatgc 540

<210> 149

<211> 129

<212> PRT

<213> Mycobacterium tuberculosis

<400> 149

Met Asn Leu Arg Arg His Gln Thr Leu Thr Leu Arg Leu Leu Ala Ala

1 5 10 15
 Ser Ala Gly Ile Leu Ser Ala Ala Ala Phe Ala Ala Pro Ala Gln Ala
 20 25 30
 Asn Pro Val Asp Asp Ala Phe Ile Ala Ala Leu Asn Asn Ala Gly Val
 35 40 45
 Asn Tyr Gly Asp Pro Val Asp Ala Lys Ala Leu Gly Gln Ser Val Cys
 50 55 60
 Pro Ile Leu Ala Glu Pro Gly Gly Ser Phe Asn Thr Ala Val Ala Ser
 65 70 75 80
 Val Val Ala Arg Ala Gln Gly Met Ser Gln Asp Met Ala Gln Thr Phe
 85 90 95
 Thr Ser Ile Ala Ile Ser Met Tyr Cys Pro Ser Val Met Ala Asp Val
 100 105 110
 Ala Ser Gly Asn Leu Pro Ala Leu Pro Asp Met Pro Gly Leu Pro Gly
 115 120 125
 Ser

<210> 150
 <211> 400
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 150
 atagtttggg gaaggtgtcc ataaatgagg ctgtcgttga ccgcattgag cgccggtgta 60
 ggcgccgtgg caatgtcgtt gaccgtcggg gccggggtcg cctccgcaga tcccgtggac 120
 gcggtcatta acaccacctg caattacggg caggtagtag ctgcgctcaa cgcgacggat 180
 ccgggggctg ccgcacagtt caacgcctca ccggtggcgc agtcctattt gcgcaatttc 240
 ctcgccgcac cgccacctca gcgcgtgcc atggccgcgc aattgcaagc tgtgccgggg 300
 gcggcacagt acatcggcct tgtcgagtcg gttgccggct cctgcaacaa ctattaagcc 360
 catgcgggcc ccatcccgcg acccgcatc gtcgccgggg 400

<210> 151
 <211> 110
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 151
 Met Arg Leu Ser Leu Thr Ala Leu Ser Ala Gly Val Gly Ala Val Ala

1	5	10	15
Met Ser Leu Thr Val Gly Ala Gly Val Ala Ser Ala Asp Pro Val Asp			
20	25	30	
Ala Val Ile Asn Thr Thr Cys Asn Tyr Gly Gln Val Val Ala Ala Leu			
35	40	45	
Asn Ala Thr Asp Pro Gly Ala Ala Ala Gln Phe Asn Ala Ser Pro Val			
50	55	60	
Ala Gln Ser Tyr Leu Arg Asn Phe Leu Ala Ala Pro Pro Pro Gln Arg			
65	70	75	80
Ala Ala Met Ala Ala Gln Leu Gln Ala Val Pro Gly Ala Ala Gln Tyr			
85	90	95	
Ile Gly Leu Val Glu Ser Val Ala Gly Ser Cys Asn Asn Tyr			
100	105	110	

<210> 152

<211> 990

<212> DNA

<213> Mycobacterium tuberculosis

<400> 152

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aatagtaata tcgctgtgcg gttgcaaaac gtgtgaccga ggttccgcag tcgagcgctg 60
cgggccgcct tcgaggagga cgaaccacag tcatgacgaa catcgaggc ctgatcaagc 120
aggtcccaga tacctggtcg gagcgcaagc tgaccgacgg cgatttcacg ctggaccgcg 180
aggccgcca cgcggtgctg gacgagatca acgagcgcg cgtggaggaa gcgctacaga 240
ttcgggagaa agaggccgc gacggcatcg aagggtcgg aaccgtgctg acggcgggccc 300
ccgagcgcg caccgaggcg atccgcaagg cgctgtcgat gggcgccgac aaggccgtcc 360
acctaaagga cgacggcatg cacggctcgg acgtcatcca aaccgggtgg gctttggcgc 420
gcgctgtgg caccatcgag ggcaccgagc tggatgatcg aggcaacgaa tcgaccgacg 480
gggtgggccc tgccgtgccc gccatcatcg ccgagtacct gggcctgccc cagctcacc 540
acctgcgcaa agtgtcgatc gaggcgccga agatcaccgg cgagcgtgag accgatgagg 600
gcgtattcac cctcgaggcc acgctgcccc cggtgatcag cgtgaacgag aagatcaacg 660
agccgcgctt cccgtccttc aaaggcatca tggccgcaa gaagaaggaa gttaccgtgc 720
tgaccctggc cgagatcggg gtcgagagcg acgaggtggg gctggccaac gccggatcca 780
ccgtgctggc gtcgacgccc aaaccggcca agactgccgg ggagaagggt accgacgagg 840
gtgaaggcgg caaccagatc gtgcagtacc tgggtgccc gaaaatcatc taagacatac 900
gcacctccca aagacgagag cgatataacc catggctgaa gtactgggtg tcgttgagca 960
cgctgaaggc gcgttaaaga aggtcagcgc
990

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<210> 153

<211> 266

<212> PRT

<213> Mycobacterium tuberculosis

<400> 153

Met Thr Asn Ile Val Val Leu Ile Lys Gln Val Pro Asp Thr Trp Ser
1 5 10 15
Glu Arg Lys Leu Thr Asp Gly Asp Phe Thr Leu Asp Arg Glu Ala Ala
20 25 30
Asp Ala Val Leu Asp Glu Ile Asn Glu Arg Ala Val Glu Glu Ala Leu
35 40 45
Gln Ile Arg Glu Lys Glu Ala Ala Asp Gly Ile Glu Gly Ser Val Thr
50 55 60
Val Leu Thr Ala Gly Pro Glu Arg Ala Thr Glu Ala Ile Arg Lys Ala
65 70 75 80
Leu Ser Met Gly Ala Asp Lys Ala Val His Leu Lys Asp Asp Gly Met
85 90 95
His Gly Ser Asp Val Ile Gln Thr Gly Trp Ala Leu Ala Arg Ala Leu
100 105 110
Gly Thr Ile Glu Gly Thr Glu Leu Val Ile Ala Gly Asn Glu Ser Thr
115 120 125
Asp Gly Val Gly Gly Ala Val Pro Ala Ile Ile Ala Glu Tyr Leu Gly
130 135 140
Leu Pro Gln Leu Thr His Leu Arg Lys Val Ser Ile Glu Gly Gly Lys
145 150 155 160
Ile Thr Gly Glu Arg Glu Thr Asp Glu Gly Val Phe Thr Leu Glu Ala
165 170 175
Thr Leu Pro Ala Val Ile Ser Val Asn Glu Lys Ile Asn Glu Pro Arg
180 185 190
Phe Pro Ser Phe Lys Gly Ile Met Ala Ala Lys Lys Lys Glu Val Thr
195 200 205
Val Leu Thr Leu Ala Glu Ile Gly Val Glu Ser Asp Glu Val Gly Leu
210 215 220
Ala Asn Ala Gly Ser Thr Val Leu Ala Ser Thr Pro Lys Pro Ala Lys
225 230 235 240

Thr Ala Gly Glu Lys Val Thr Asp Glu Gly Glu Gly Gly Asn Gln Ile
245 250 255

Val Gln Tyr Leu Val Ala Gln Lys Ile Ile
260 265

<210> 154

<211> 25

<212> DNA

<213> Mycobacterium tuberculosis

<400> 154

ctgagatcta tgaacctacg gcgcc

25

<210> 155

<211> 35

<212> DNA

<213> Mycobacterium tuberculosis

<400> 155

ctcccatggt accctaggac ccgggcagcc ccggc

35

<210> 156

<211> 29

<212> DNA

<213> Mycobacterium tuberculosis

<400> 156

ctgagatcta tgaggctgtc gttgaccgc

29

<210> 157

<211> 30

<212> DNA

<213> Mycobacterium tuberculosis

<400> 157

ctccccgggc ttaatagttg ttgcaggagc

30

<210> 158

<211> 33

<212> DNA

<213> Mycobacterium tuberculosis

<400> 158

gcttagatct atgattttct gggcaaccag gta

33

<210> 159

<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 159
gcttccatgg gcgaggcaca ggcgtgggaa 30

<210> 160
<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 160
ctgagatcta gaatgccaca gggaactgtg 30

<210> 161
<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 161
tctcccgggg gtaactcaga gcgagcggac 30

<210> 162
<211> 27
<212> DNA
<213> Mycobacterium tuberculosis

<400> 162
ctgagatcta tgaacgtcac cgtatcc 27

<210> 163
<211> 27
<212> DNA
<213> Mycobacterium tuberculosis

<400> 163
tctcccgggg ctcacccacc ggccacg 27

<210> 164
<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 164
ctgagatcta tggcaacacg ttttatgacg 30

<210> 165

<210> 170
 <211> 15
 <212> PRT
 <213> Mycobacterium tuberculosis

<220>
 <221> VARIANT
 <222> (1)
 <223> Thr could also be Ala

<400> 170
 Thr Arg Phe Met Thr Asp Pro His Ala Met Arg Asp Met Ala Gly
 1 5 10 15

<210> 171
 <211> 15
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 171
 Pro Lys Arg Ser Glu Tyr Arg Gln Gly Thr Pro Asn Trp Val Asp
 1 5 10 15

<210> 172
 <211> 404
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 172
 Met Ala Thr Val Asn Arg Ser Arg His His His His His His His His
 1 5 10 15

Ile Glu Gly Arg Ser Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu
 20 25 30

Gln Val Pro Ser Pro Ser Met Gly Arg Asp Ile Lys Val Gln Phe Gln
 35 40 45

Ser Gly Gly Asn Asn Ser Pro Ala Val Tyr Leu Leu Asp Gly Leu Arg
 50 55 60

Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Pro Ala Phe Glu
 65 70 75 80

Trp Tyr Tyr Gln Ser Gly Leu Ser Ile Val Met Pro Val Gly Gly Gln
 85 90 95

Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly Lys Ala Gly
100 105 110

Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu Thr Ser Glu Leu Pro Gln
115 120 125

Trp Leu Ser Ala Asn Arg Ala Val Lys Pro Thr Gly Ser Ala Ala Ile
130 135 140

Gly Leu Ser Met Ala Gly Ser Ser Ala Met Ile Leu Ala Ala Tyr His
145 150 155 160

Pro Gln Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu Leu Asp Pro
165 170 175

Ser Gln Gly Met Gly Pro Ser Leu Ile Gly Leu Ala Met Gly Asp Ala
180 185 190

Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Ser Ser Asp Pro Ala
195 200 205

Trp Glu Arg Asn Asp Pro Thr Gln Gln Ile Pro Lys Leu Val Ala Asn
210 215 220

Asn Thr Arg Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro Asn Glu Leu
225 230 235 240

Gly Gly Ala Asn Ile Pro Ala Glu Phe Leu Glu Asn Phe Val Arg Ser
245 250 255

Ser Asn Leu Lys Phe Gln Asp Ala Tyr Asn Ala Ala Gly Gly His Asn
260 265 270

Ala Val Phe Asn Phe Pro Pro Asn Gly Thr His Ser Trp Glu Tyr Trp
275 280 285

Gly Ala Gln Leu Asn Ala Met Lys Gly Asp Leu Gln Ser Ser Leu Gly
290 295 300

Ala Gly Lys Leu Ala Met Thr Glu Gln Gln Trp Asn Phe Ala Gly Ile
305 310 315 320

Glu Ala Ala Ala Ser Ala Ile Gln Gly Asn Val Thr Ser Ile His Ser
325 330 335

Leu Leu Asp Glu Gly Lys Gln Ser Leu Thr Lys Leu Ala Ala Ala Trp
340 345 350

145		150		155		160
Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Pro Ala Phe						
	165		170		175	
Glu Trp Tyr Tyr Gln Ser Gly Leu Ser Ile Val Met Pro Val Gly Gly						
	180		185		190	
Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly Lys Ala						
	195		200		205	
Gly Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu Thr Ser Glu Leu Pro						
	210		215		220	
Gln Trp Leu Ser Ala Asn Arg Ala Val Lys Pro Thr Gly Ser Ala Ala						
	225		230		235	240
Ile Gly Leu Ser Met Ala Gly Ser Ser Ala Met Ile Leu Ala Ala Tyr						
	245		250		255	
His Pro Gln Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu Leu Asp						
	260		265		270	
Pro Ser Gln Gly Met Gly Pro Ser Leu Ile Gly Leu Ala Met Gly Asp						
	275		280		285	
Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Ser Ser Asp Pro						
	290		295		300	
Ala Trp Glu Arg Asn Asp Pro Thr Gln Gln Ile Pro Lys Leu Val Ala						
	305		310		315	320
Asn Asn Thr Arg Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro Asn Glu						
	325		330		335	
Leu Gly Gly Ala Asn Ile Pro Ala Glu Phe Leu Glu Asn Phe Val Arg						
	340		345		350	
Ser Ser Asn Leu Lys Phe Gln Asp Ala Tyr Asn Ala Ala Gly Gly His						
	355		360		365	
Asn Ala Val Phe Asn Phe Pro Pro Asn Gly Thr His Ser Trp Glu Tyr						
	370		375		380	
Trp Gly Ala Gln Leu Asn Ala Met Lys Gly Asp Leu Gln Ser Ser Leu						
	385		390		395	400
Gly Ala Gly						

<210> 174
 <211> 291
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 174
 atgtcgcaga ttatgtacaa ctatccggcg atgatggctc atgccgggga catggccggt 60
 tatgccgggca cgctgcagag cttggggggcc gatatcgcca gtgagcaggc cgtgctgtcc 120
 agtgcttggc aggggtgatac cgggatcacg tatcagggtc ggcagaccca gtggaaccag 180
 gccctagagg atctgggtgcg ggcctatcag tcgatgtctg gcacccatga gtccaacacc 240
 atggcgatgt tggctcgaga tggggccgaa gccgccaagt ggggcggcta g 291

<210> 175
 <211> 96
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 175
 Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Met Ala His Ala Gly
 1 5 10 15
 Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Asp Ile
 20 25 30
 Ala Ser Glu Gln Ala Val Leu Ser Ser Ala Trp Gln Gly Asp Thr Gly
 35 40 45
 Ile Thr Tyr Gln Gly Trp Gln Thr Gln Trp Asn Gln Ala Leu Glu Asp
 50 55 60
 Leu Val Arg Ala Tyr Gln Ser Met Ser Gly Thr His Glu Ser Asn Thr
 65 70 75 80
 Met Ala Met Leu Ala Arg Asp Gly Ala Glu Ala Ala Lys Trp Gly Gly
 85 90 95

<210> 176
 <211> 363
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 176

gtgtcgcaga gtatgtacag ctaccggcg atgacggcca atgtcggaga catggccggt 60
tatacgggca cgacgcagag cttgggggcc gatatcgcca gtgagcgcac cgcgccgtcg 120
cgtgcttgcc aaggtgatct cgggatgagt catcaggact ggcaggccca gtggaatcag 180
gccatggagg ctctcgcgcg ggcctaccgt cggtgccggc gagcactacg ccagatcggg 240
gtgctggaaa ggccggtagg cgattcgtca gactgcggaa cgattagggt ggggtcgttc 300
cggggtcggg ggctggaccc gcgccatgcg ggtccagcca cggccgccga cgccggagac 360
taa 363

<210> 177

<211> 120

<212> PRT

<213> Mycobacterium tuberculosis

<400> 177

Met Ser Gln Ser Met Tyr Ser Tyr Pro Ala Met Thr Ala Asn Val Gly
1 5 10 15
Asp Met Ala Gly Tyr Thr Gly Thr Thr Gln Ser Leu Gly Ala Asp Ile
20 25 30
Ala Ser Glu Arg Thr Ala Pro Ser Arg Ala Cys Gln Gly Asp Leu Gly
35 40 45
Met Ser His Gln Asp Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Ala
50 55 60
Leu Ala Arg Ala Tyr Arg Arg Cys Arg Arg Ala Leu Arg Gln Ile Gly
65 70 75 80
Val Leu Glu Arg Pro Val Gly Asp Ser Ser Asp Cys Gly Thr Ile Arg
85 90 95
Val Gly Ser Phe Arg Gly Arg Trp Leu Asp Pro Arg His Ala Gly Pro
100 105 110
Ala Thr Ala Ala Asp Ala Gly Asp
115 120

<210> 178

<211> 297

<212> DNA

<213> Mycobacterium tuberculosis

<400> 178

atggcctcgc gttttatgac ggatccgcac gcgatgcggg acatggcggg ccgttttgag 60
gtgcacgccc agacggtgga ggacgaggct cgccggatgt gggcgtccgc gcaaaacatc 120

tcgggcgcg gctggagtgg catggccgag gcgacctcgc tagacacccat gacccagatg 180
aatcaggcgt ttcgcaacat cgtgaacatg ctgcacgggg tgcgtgacgg gctgggttcgc 240
gacgccaaca actacgaaca gcaagagcag gcctcccagc agatcctcag cagctga 297

<210> 179

<211> 98

<212> PRT

<213> Mycobacterium tuberculosis

<400> 179

Met Ala Ser Arg Phe Met Thr Asp Pro His Ala Met Arg Asp Met Ala

1 5 10 15

Gly Arg Phe Glu Val His Ala Gln Thr Val Glu Asp Glu Ala Arg Arg

20 25 30

Met Trp Ala Ser Ala Gln Asn Ile Ser Gly Ala Gly Trp Ser Gly Met

35 40 45

Ala Glu Ala Thr Ser Leu Asp Thr Met Thr Gln Met Asn Gln Ala Phe

50 55 60

Arg Asn Ile Val Asn Met Leu His Gly Val Arg Asp Gly Leu Val Arg

65 70 75 80

Asp Ala Asn Asn Tyr Glu Gln Gln Glu Gln Ala Ser Gln Gln Ile Leu

85 90 95

Ser Ser

<210> 180

<211> 297

<212> DNA

<213> Mycobacterium tuberculosis

<400> 180

atggcctcac gttttatgac ggatccgcac gcgatgcggg acatggcggg ccgtttttgag 60

gtgcacgccc agacggtgga ggacgaggct cgccggatgt gggcgtccgc gcaaaacatt 120

tccggtgcgg gctggagtgg catggccgag gcgacctcgc tagacacccat ggccagatg 180

aatcaggcgt ttcgcaacat cgtgaacatg ctgcacgggg tgcgtgacgg gctgggttcgc 240

gacgccaaca actacgagca gcaagagcag gcctcccagc agatcctcag cagctaa 297

<210> 181

<211> 98

<212> PRT

<213> Mycobacterium tuberculosis

<400> 181

Met Ala Ser Arg Phe Met Thr Asp Pro His Ala Met Arg Asp Met Ala
1 5 10 15

Gly Arg Phe Glu Val His Ala Gln Thr Val Glu Asp Glu Ala Arg Arg
20 25 30

Met Trp Ala Ser Ala Gln Asn Ile Ser Gly Ala Gly Trp Ser Gly Met
35 40 45

Ala Glu Ala Thr Ser Leu Asp Thr Met Ala Gln Met Asn Gln Ala Phe
50 55 60

Arg Asn Ile Val Asn Met Leu His Gly Val Arg Asp Gly Leu Val Arg
65 70 75 80

Asp Ala Asn Asn Tyr Glu Gln Gln Glu Gln Ala Ser Gln Gln Ile Leu
85 90 95

Ser Ser

<210> 182

<211> 297

<212> DNA

<213> Mycobacterium tuberculosis

<400> 182

atggcctcac gttttatgac ggatccgcat gcgatgcggg acatggcggg ccgttttgag 60
gtgcacgccc agacgggtgga ggacgaggct cgccggatgt gggcgtccgc gcaaaacatt 120
tccggtgcgg gctggagtgg catggccgag gcgacctcgc tagacaccat gacctagatg 180
aatcaggcgt ttcgcaacat cgtgaacatg ctgcacgggg tgcgtgacgg gctggttcgc 240
gacgccaaca actacgaaca gcaagagcag gcctcccagc agatcctgag cagctag 297

<210> 183

<211> 98

<212> PRT

<213> Mycobacterium tuberculosis

<400> 183

Met Ala Ser Arg Phe Met Thr Asp Pro His Ala Met Arg Asp Met Ala
1 5 10 15

Gly Arg Phe Glu Val His Ala Gln Thr Val Glu Asp Glu Ala Arg Arg
20 25 30

Met Trp Ala Ser Ala Gln Asn Ile Ser Gly Ala Gly Trp Ser Gly Met
 35 40 45

Ala Glu Ala Thr Ser Leu Asp Thr Met Thr Gln Met Asn Gln Ala Phe
 50 55 60

Arg Asn Ile Val Asn Met Leu His Gly Val Arg Asp Gly Leu Val Arg
 65 70 75 80

Asp Ala Asn Asn Tyr Glu Gln Gln Glu Gln Ala Ser Gln Gln Ile Leu
 85 90 95

Ser Ser

<210> 184

<211> 297

<212> DNA

<213> Mycobacterium tuberculosis

<400> 184

atgacctcgc gttttatgac ggatccgcac gcgatgcggg acatggcggg ccgttttgag 60
 gtgcacgccc agacggtgga ggacgaggct cgccggatgt gggcgtccgc gcaaaacatt 120
 tccggcgagg gctggagtgg catggccgag gcgacctcgc tagacaccat gaccagatg 180
 aatcaggcgt ttcgcaacat cgtgaacatg ctgcacgggg tgcgtgacgg gctggttcgc 240
 gacgccaaca actacgaaca gcaagagcag gcctcccagc agatcctcag cagctga 297

<210> 185

<211> 98

<212> PRT

<213> Mycobacterium tuberculosis

<400> 185

Met Thr Ser Arg Phe Met Thr Asp Pro His Ala Met Arg Asp Met Ala
 1 5 10 15

Gly Arg Phe Glu Val His Ala Gln Thr Val Glu Asp Glu Ala Arg Arg
 20 25 30

Met Trp Ala Ser Ala Gln Asn Ile Ser Gly Ala Gly Trp Ser Gly Met
 35 40 45

Ala Glu Ala Thr Ser Leu Asp Thr Met Thr Gln Met Asn Gln Ala Phe
 50 55 60

Arg Asn Ile Val Asn Met Leu His Gly Val Arg Asp Gly Leu Val Arg
 65 70 75 80

Asp Ala Asn Asn Tyr Glu Gln Gln Glu Gln Ala Ser Gln Gln Ile Leu
85 90 95

Ser Ser

<210> 186

<211> 20

<212> DNA

<213> Mycobacterium tuberculosis

<400> 186

ggaatgaaaa ggggtttgtg

20

<210> 187

<211> 20

<212> DNA

<213> Mycobacterium tuberculosis

<400> 187

gaccacgccc gcgccgtgtg

20

<210> 188

<211> 27

<212> DNA

<213> Mycobacterium tuberculosis

<400> 188

gcaacacccg ggatgtcgca gattatg

27

<210> 189

<211> 30

<212> DNA

<213> Mycobacterium tuberculosis

<400> 189

ctaagcttgg atccctagcc gcccacttg

30

<210> 190

<211> 22

<212> DNA

<213> Mycobacterium tuberculosis

<400> 190

gaatatttga aagggttcg tg

22

<210> 191
<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 191
ctactaagct tggatcctta gtctccggcg 30

<210> 192
<211> 27
<212> DNA
<213> Mycobacterium tuberculosis

<400> 192
gcaacacccg ggggtgcgca gaggatg 27

<210> 193
<211> 30
<212> DNA
<213> Mycobacterium tuberculosis

<400> 193
ctactaagct tggatcctta gtctccggcg 30

SEQUENCE LISTING

<110> Statens Serum Institut

5 <120> M. tuberculosis antigens

<130> 26166

10 <160> 64

<170> FastSEQ for Windows Version 3.0

15 <210> 194
<211> 381
<212> DNA
<213> Mycobacterium tuberculosis

20 <220>
<221> CDS
<222> (91) ... (378)

<400> 194

25 ggccgcccgt acctatgtgg ccgccgatgc tgcggacgcg tcgacctata ccgggttctg 60
atcgaaccct gctgaccgag aggacttgat atg tcg caa atc atg tac aac tac 114
Met Ser Gln Ile Met Tyr Asn Tyr
1 5

30 ccc gcg atg ttg ggt cac gcc ggg gat atg gcc gga tat gcc ggc acg 162
Pro Ala Met Leu Gly His Ala Gly Asp Met Ala Gly Tyr Ala Gly Thr
10 15 20

35 ctg cag agc ttg ggt gcc gag atc gcc gtg gag cag gcc gcg ttg cag 210
Leu Gln Ser Leu Gly Ala Glu Ile Ala Val Glu Gln Ala Ala Leu Gln
25 30 35 40

40 agt gcg tgg cag ggc gat acc ggg atc acg tat cag gcg tgg cag gca 258
Ser Ala Trp Gln Gly Asp Thr Gly Ile Thr Tyr Gln Ala Trp Gln Ala
45 50 55

45 cag tgg aac cag gcc atg gaa gat ttg gtg cgg gcc tat cat gcg atg 306
Gln Trp Asn Gln Ala Met Glu Asp Leu Val Arg Ala Tyr His Ala Met
60 65 70

50 tcc agc acc cat gaa gcc aac acc atg gcg atg atg gcc cgc gac acc 354
Ser Ser Thr His Glu Ala Asn Thr Met Ala Met Met Ala Arg Asp Thr
75 80 85

55 gcc gaa gcc gcc aaa tgg ggc ggc tag 381
Ala Glu Ala Ala Lys Trp Gly Gly
90 95

<210> 195
<211> 96
<212> PRT

tuberculosis

Met 1	Ser	Gln	Ile	Met 5	Tyr	Asn	Tyr	Pro	Ala 10	Met	Leu	Gly	His	Ala 15	Gly
Asp	Met	Ala	Gly 20	Tyr	Ala	Gly	Thr	Leu 25	Gln	Ser	Leu	Gly	Ala 30	Glu	Ile
Ala	Val	Glu	Gln	Ala	Ala	Leu	Gln 40	Ser	Ala	Trp	Gln	Gly 45	Asp	Thr	Gly
Ile	Thr 50	Tyr	Gln	Ala	Trp	Gln 55	Ala	Gln	Trp	Asn	Gln 60	Ala	Met	Glu	Asp
Leu 65	Val	Arg	Ala	Tyr	His 70	Ala	Met	Ser	Ser	Thr 75	His	Glu	Ala	Asn 80	Thr
Met	Ala	Met	Met	Ala 85	Arg	Asp	Thr	Ala 90	Glu	Ala	Ala	Lys	Trp	Gly 95	Gly

<213> Mycobacterium tuberculosis

 $\langle 222 \rangle \quad (1) \dots (360)$

gtg	tcg	cag	agt	atg	tac	agc	tac	ccg	gcg	atg	acg	gcc	aat	gtc	gga	48
Met	Ser	Gln	Ser	Met	Tyr	Ser	Tyr	Pro	Ala	Met	Thr	Ala	Asn	Val	Gly	
1			5			10			15							
gac	atg	gcc	ggt	tat	acg	ggc	acg	acg	cag	agc	ttg	ggg	gcc	gat	atc	96
Asp	Met	Ala	Gly	Tyr	Thr	Gly	Thr	Thr	Gln	Ser	Leu	Gly	Ala	Asp	Ile	
20			25			30										
gcc	agt	gag	cgc	acc	gcg	ccg	tcg	cgt	gct	tgc	caa	ggt	gat	ctc	ggg	144
Ala	Ser	Glu	Arg	Thr	Ala	Pro	Ser	Arg	Ala	Cys	Gln	Gly	Asp	Leu	Gly	
35			40			45										
atg	agt	cat	cag	gac	tgg	cag	gcc	cag	tgg	aat	cag	gcc	atg	gag	gct	192
Met	Ser	His	Gln	Asp	Trp	Gln	Ala	Gln	Trp	Asn	Gln	Ala	Met	Glu	Ala	
50			55			60										
ctc	gcg	cgg	gcc	tac	cgt	cgg	tgc	cgg	cga	gca	cta	cgc	cag	atc	ggg	240
Leu	Ala	Arg	Ala	Tyr	Arg	Arg	Cys	Arg	Arg	Ala	Leu	Arg	Gln	Ile	Gly	
65			70			75			80							
gtg	ctg	gaa	agg	ccg	gta	ggc	gat	tcg	tca	gac	tgc	gga	acg	att	agg	288
Val	Leu	Glu	Arg	Pro	Val	Gly	Asp	Ser	Ser	Asp	Cys	Gly	Thr	Ile	Arg	
85			90			95										
gtg	ggg	tcg	ttc	cgg	ggt	cgg	tgg	ctg	gac	ccg	cgc	cat	gcg	ggt	cca	336
Val	Gly	Ser	Phe	Arg	Gly	Arg	Trp	Leu	Asp	Pro	Arg	His	Ala	Gly	Pro	
100			105			110										
gcc	acg	gcc	gcc	gac	gcc	gga	gac	taa								363
Ala	Thr	Ala	Ala	Asp	Ala	Gly	Asp									

115

120

5 <210> 197
 <211> 120
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 197
 10 Met Ser Gln Ser Met Tyr Ser Tyr Pro Ala Met Thr Ala Asn Val Gly
 1 5 10 15
 Asp Met Ala Gly Tyr Thr Gly Thr Thr Gln Ser Leu Gly Ala Asp Ile
 20 25 30
 Ala Ser Glu Arg Thr Ala Pro Ser Arg Ala Cys Gln Gly Asp Leu Gly
 35 40 45
 15 Met Ser His Gln Asp Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Ala
 50 55 60
 Leu Ala Arg Ala Tyr Arg Arg Cys Arg Arg Ala Leu Arg Gln Ile Gly
 65 70 75 80
 20 Val Leu Glu Arg Pro Val Gly Asp Ser Ser Asp Cys Gly Thr Ile Arg
 85 90 95
 Val Gly Ser Phe Arg Gly Arg Trp Leu Asp Pro Arg His Ala Gly Pro
 100 105 110
 Ala Thr Ala Ala Asp Ala Gly Asp
 25 115 120

<210> 198
 <211> 291
 <212> DNA
 30 <213> Mycobacterium tuberculosis

<220>
 <221> CDS
 <222> (1)...(288)

<400> 198
 atg tcg cag att atg tac aac tat ccg gcg atg atg gct cat gcc ggg .48
 Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Met Ala His Ala Gly
 1 5 10 15
 40 gac atg gcc ggt tat gcg ggc acg ctg cag agc ttg ggg gcc gat atc .96
 Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Asp Ile
 20 25 30
 45 gcc agt gag cag gcc gtg ctg tcc agt gct tgg cag ggt gat acc ggg 144
 Ala Ser Glu Gln Ala Val Leu Ser Ser Ala Trp Gln Gly Asp Thr Gly
 35 40 45
 50 atc acg tat cag ggc tgg cag acc cag tgg aac cag gcc cta gag gat 192
 Ile Thr Tyr Gln Gly Trp Gln Thr Gln Trp Asn Gln Ala Leu Glu Asp
 50 55 60
 ctg gtg cgg gcc tat cag tcg atg tct ggc acc cat gag tcc aac acc 240
 Leu Val Arg Ala Tyr Gln Ser Met Ser Gly Thr His Glu Ser Asn Thr
 55 65 70 75 80

atg gcg atg ttg gct cga gat ggg gcc gaa gcc gcc aag tgg ggc ggc 288
Met Ala Met Leu Ala Arg Asp Gly Ala Glu Ala Ala Lys Trp Gly Gly
85 90 95

5 tag 291

<210> 199
<211> 96
<212> PRT

10 <213> Mycobacterium tuberculosis

<400> 199

Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Met Ala His Ala Gly
1 5 10 15
15 Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Asp Ile
20 25 30
Ala Ser Glu Gln Ala Val Leu Ser Ser Ala Trp Gln Gly Asp Thr Gly
35 40 45
20 Ile Thr Tyr Gln Gly Trp Gln Thr Gln Trp Asn Gln Ala Leu Glu Asp
50 55 60
Leu Val Arg Ala Tyr Gln Ser Met Ser Gly Thr His Glu Ser Asn Thr
65 70 75 80
Met Ala Met Leu Ala Arg Asp Gly Ala Glu Ala Ala Lys Trp Gly Gly
85 90 95

25

<210> 200
<211> 60
<212> DNA

30 <213> Mycobacterium tuberculosis

<220>
<221> CDS
<222> (1)...(60)

35

<400> 200

atg tcg cag att atg tac aac tat ccg gcg atg atg gct cat gcc ggc 48
Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Met Ala His Ala Gly
1 5 10 15

40

gac atg gcc ggt 60
Asp Met Ala Gly
20

45

<210> 201
<211> 20
<212> PRT

50 <213> Mycobacterium tuberculosis

<400> 201

Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Met Ala His Ala Gly
1 5 10 15
55 Asp Met Ala Gly
20

887

5 <210> 202
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

 <220>
 <221> CDS
 <222> (1)...(60)

 10 <400> 202
 atg atg gct cat gcc ggg gac atg gcc ggt tat gcg ggc acg ctg cag 48
 Met Met Ala His Ala Gly Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln
 1 5 10 15

 15 agc ttg ggg gcc 60
 Ser Leu Gly Ala
 20

 20 <210> 203
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

 25 <400> 203
 Met Met Ala His Ala Gly Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln
 1 5 10 15
 Ser Leu Gly Ala
 20

 30 <210> 204
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

 35 <220>
 <221> CDS
 <222> (1)...(60)

 40 <400> 204
 tat gcg ggc acg ctg cag agc ttg ggg gcc gat atc gcc agt gag cag 48
 Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Asp Ile Ala Ser Glu Gln
 1 5 10 15

 45 gcc gtg ctg tcc 60
 Ala Val Leu Ser
 20

 50 <210> 205
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

 55 <400> 205
 Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Asp Ile Ala Ser Glu Gln

	1			5			10			15
Ala	Val	Leu	Ser							
			20							

5 <210> 206
 <211> 60
 <212> DNA
 <213> *Mycobacterium tuberculosis*

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10      <220>
      <221> CDS
      <222> (1) . . . (60)
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15 <400> 206
gat atc gcc agt gag cag gcc gtg ctg tcc agt gct tgg cag ggt gat 48
Asp Ile Ala Ser Glu Gln Ala Val Leu Ser Ser Ala Trp Gln Gly Asp
 1 5 10 15

acc ggg atc acg
20 Thr Gly Ile Thr 60
20

```

25      <210> 207
      <211> 20
      <212> PRT
      <213> Mycobacterium tuberculosis

```

```

30      <400> 207
   Asp Ile Ala Ser Glu Gln Ala Val Leu Ser Ser Ala Trp Gln Gly Asp
     1             5             10             15
   Thr Gly Ile Thr
     20

```

```
35      <210> 208
      <211> 60
      <212> DNA
      <213> Mycobacterium tuberculosis
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```
40      <220>
      <221> CDS
      <222> (1) . . . (60)
```

45 <400> 208
agt gct tgg cag ggt gat acc ggg atc acg tat cag ggc tgg cag acc 48
Ser Ala Trp Gln Gly Asp Thr Gly Ile Thr Tyr Gln Gly Trp Gln Thr
 1 5 10 15

50 cag tgg aac cag 60
Gln Trp Asn Gln
20

55	<210>	209
	<211>	20
	<212>	PRT

289

<213> Mycobacterium

tuberculosis

<400> 209

5 Ser Ala Trp Gln Gly Asp Thr Gly Ile Thr Tyr Gln Gly Trp Gln Thr
1 5 10 15
Gln Trp Asn Gln
20

<210> 210

10 <211> 60

<212> DNA

<213> Mycobacterium tuberculosis

<220>

15 <221> CDS

<222> (1)...(60)

<400> 210

20 tat cag ggc tgg cag acc cag tgg aac cag gcc cta gag gat ctg gtg 48
Tyr Gln Gly Trp Gln Thr Gln Trp Asn Gln Ala Leu Glu Asp Leu Val
1 5 10 15

cgg gcc tat cag
Arg Ala Tyr Gln
25 20

60

<210> 211

30 <211> 20

<212> PRT

<213> Mycobacterium tuberculosis

<400> 211

35 Tyr Gln Gly Trp Gln Thr Gln Trp Asn Gln Ala Leu Glu Asp Leu Val
1 5 10 15
Arg Ala Tyr Gln
20

<210> 212

40 <211> 60

<212> DNA

<213> Mycobacterium tuberculosis

<220>

45 <221> CDS

<222> (1)...(60)

<400> 212

50 gcc cta gag gat ctg gtg cgg gcc tat cag tcg atg tct ggc acc cat 48
Ala Leu Glu Asp Leu Val Arg Ala Tyr Gln Ser Met Ser Gly Thr His
1 5 10 15

gag tcc aac acc
Glu Ser Asn Thr
55 20

60

5 <210> 213
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

10 <400> 213
 Ala Leu Glu Asp Leu Val Arg Ala Tyr Gln Ser Met Ser Gly Thr His
 1 5 10 15
 Glu Ser Asn Thr
 20

15 <210> 214
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

20 <220>
 <221> CDS
 <222> (1)...(60)

25 <400> 214
 tcg atg tct ggc acc cat gag tcc aac acc atg gcg atg ttg gct cga 48
 Ser Met Ser Gly Thr His Glu Ser Asn Thr Met Ala Met Leu Ala Arg
 1 5 10 15

30 gat ggg gcc gaa 60
 Asp Gly Ala Glu
 20

35 <210> 215
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

40 <400> 215
 Ser Met Ser Gly Thr His Glu Ser Asn Thr Met Ala Met Leu Ala Arg
 1 5 10 15
 Asp Gly Ala Glu
 20

45 <210> 216
 <211> 48
 <212> DNA
 <213> Mycobacterium tuberculosis

50 <220>
 <221> CDS
 <222> (1)...(48)

55 <400> 216
 atg gcg atg ttg gct cga gat ggg gcc gaa gcc gcc aag tgg ggc ggc 48
 Met Ala Met Leu Ala Arg Asp Gly Ala Glu Ala Ala Lys Trp Gly Gly
 1 5 10 15

<213> Mycobacterium tuberculosis

Met Ala Met Leu Ala Arg Asp Gly Ala Glu Ala Ala Lys Trp Gly Gly
1 5 10 15

<213> Mycobacterium tuberculosis

<222> (1) . . . (54)

atg tcg caa atc atg tac aac tac ccc gcg atg ttg ggt cac gcc ggg 48
Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Leu Gly His Ala Gly
1 5 10 15

gat atg 54
Asp Met

<213> Mycobacterium tuberculosis

Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Leu Gly His Ala Gly
1 5 10 15
Asp Met

<213> Mycobacterium tuberculosis

<222> (1) ... (54)

atg ttg ggt cac gcc ggg gat atg gcc gga tat gcc ggc acg ctg cag 48
Met Leu Gly His Ala Gly Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln
1 5 10 15

agc ttg 54
Ser Leu

1

5

10

15

acc ggg
Thr Gly

54

5

<210> 225
<211> 18
<212> PRT
<213> Mycobacterium tuberculosis

10

<400> 225

Glu Ile Ala Val Glu Gln Ala Ala Leu Gln Ser Ala Trp Gln Gly Asp
1 5 10 15
Thr Gly

15

<210> 226
<211> 54
<212> DNA
<213> Mycobacterium tuberculosis

20

<220>
<221> CDS
<222> (1)...(54)
<223>

25

30

<400> 226

35

agt gcg tgg cag ggc gat acc ggg atc acg tat cag gcg tgg cag gca
Ser Ala Trp Gln Gly Asp Thr Gly Ile Thr Tyr Gln Ala Trp Gln Ala
1 5 10 15

48

cag tgg
Gln Trp

40

54

<210> 227
<211> 18
<212> PRT
<213> Mycobacterium tuberculosis

45

<400> 227

50

Ser Ala Trp Gln Gly Asp Thr Gly Ile Thr Tyr Gln Ala Trp Gln Ala
1 5 10 15
Gln Trp

55

<210> 228
<211> 51

1294

<212> DNA
<213> Mycobacterium tuberculosis

5 <220>
<221> CDS
<222> (1)...(51)
<223>

10

<400> 228

15 tat cag gcg tgg cag gca cag tgg aac cag gcc atg gaa gat ttg gtg 48
Tyr Gln Ala Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Asp Leu Val
1 5 10 15

cgg 51
Arg

20

<210> 229
<211> 17
<212> PRT
<213> Mycobacterium tuberculosis

25

<400> 229

30 Tyr Gln Ala Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Asp Leu Val
1 5 10 15
Arg

<210> 230
<211> 54
<212> DNA
<213> Mycobacterium tuberculosis

35

<220>
<221> CDS
<222> (1)...(54)

40

<400> 230

45 gcc atg gaa gat ttg gtg cgg gcc tat cat gcg atg tcc agc acc cat 48
Ala Met Glu Asp Leu Val Arg Ala Tyr His Ala Met Ser Ser Thr His
1 5 10 15

gaa gcc 54
Glu Ala

50

<210> 231
<211> 18
<212> PRT
<213> Mycobacterium tuberculosis

55

13 95

```

      <400> 231
Ala Met Glu Asp Leu Val Arg Ala Tyr His Ala Met Ser Ser Thr His
  1              5              10              15
Glu Ala

```

10

<210>	232
<211>	54
<212>	DNA
<213>	Mycobacterium tuberculosis

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15      <220>
      <221> CDS
      <222> (1) . . . (54)

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<400> 232
 gcg atg tcc agc acc cat gaa gcc aac acc atg gcg atg atg gcc cgc 48
 Ala Met Ser Ser Thr His Glu Ala Asn Thr Met Ala Met Met Ala Arg
 20 1 5 10 15

gac acg 54
Asp Thr

30

<210>	233
<211>	18
<212>	PRT
<213>	Mycobacterium tuberculosis

Ala Met Ser Ser Thr His Glu Ala Asn Thr Met Ala Met Met Ala Arg
 1 5 10 15
 35 Asp Thr

40

<210>	234
<211>	48
<212>	DNA
<213>	Mycobacterium tuberculosis

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45      <220>
      <221> CDS
      <222> (1) . . . (48)

```

atg gcg atg atg gcc cgc gac acc gcc gaa gcc gcc aaa tgg ggc ggc 48
 Met Ala Met Met Ala Arg Asp Thr Ala Glu Ala Ala Lys Trp Gly Gly
 1 5 10 15

55

<210>	235
<211>	16
<212>	PRT
<213>	Mycobacterium tuberculosis

496

<400> 235
Met Ala Met Met Ala Arg Asp Thr Ala Glu Ala Ala Lys Trp Gly Gly
1 5 10 15

5 <210> 236
<211> 60
<212> DNA
<213> Mycobacterium tuberculosis

10 <220>
<221> CDS
<222> (1)...(60)

<400> 236
15 gtg tcg cag agt atg tac agc tac ccg gcg atg acg gcc aat gtc gga 48
Met Ser Gln Ser Met Tyr Ser Tyr Pro Ala Met Thr Ala Asn Val Gly
1 5 10 15

20 gac atg gcc ggt 60
Asp Met Ala Gly
20

25 <210> 237
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 237
30 Met Ser Gln Ser Met Tyr Ser Tyr Pro Ala Met Thr Ala Asn Val Gly
1 5 10 15
Asp Met Ala Gly
20

35 <210> 238
<211> 60
<212> DNA
<213> Mycobacterium tuberculosis

40 <220>
<221> CDS
<222> (1)...(60)

<400> 238
45 atg acg gcc aat gtc gga gac atg gcc ggt tat acg ggc acg acg cag 48
Met Thr Ala Asn Val Gly Asp Met Ala Gly Tyr Thr Gly Thr Thr Gln
1 5 10 15

50 agc ttg ggg gcc 60
Ser Leu Gly Ala
20

55 <210> 239
<211> 20
<212> PRT

75 97

<213> Mycobacterium tuberculosis

<400> 239

5 Met Thr Ala Asn Val Gly Asp Met Ala Gly Tyr Thr Gly Thr Thr Gln
 1 5 10 15
 Ser Leu Gly Ala
 20

<210> 240

10 <211> 60

<212> DNA

<213> Mycobacterium tuberculosis

<220>

15 <221> CDS

<222> (1)...(60)

<400> 240

20 tat acg ggc acg acg cag agc ttg ggg gcc gat atc gcc agt gag cgc 48
 Tyr Thr Gly Thr Thr Gln Ser Leu Gly Ala Asp Ile Ala Ser Glu Arg
 1 5 10 15

acc gcg ccg tcg 60
 Thr Ala Pro Ser
 20

<210> 241

30 <211> 20

<212> PRT

<213> Mycobacterium tuberculosis

<400> 241

35 Tyr Thr Gly Thr Thr Gln Ser Leu Gly Ala Asp Ile Ala Ser Glu Arg
 1 5 10 15
 Thr Ala Pro Ser
 20

<210> 242

40 <211> 60

<212> DNA

<213> Mycobacterium tuberculosis

<220>

45 <221> CDS

<222> (1)...(60)

<400> 242

50 gat atc gcc agt gag cgc acc gcg ccg tcg cgt gct tgc caa ggt gat 48
 Asp Ile Ala Ser Glu Arg Thr Ala Pro Ser Arg Ala Cys Gln Gly Asp
 1 5 10 15

ctc ggg atg agt 60
 Leu Gly Met Ser
 20

5 <210> 243
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 243
 Asp Ile Ala Ser Glu Arg Thr Ala Pro Ser Arg Ala Cys Gln Gly Asp
 1 5 10 15
 10 Leu Gly Met Ser
 20

15 <210> 244
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

20 <220>
 <221> CDS
 <222> (1)...(60)

<400> 244
 cgt gct tgc caa ggt gat ctc ggg atg agt cat cag gac tgg cag gcc 48
 Arg Ala Cys Gln Gly Asp Leu Gly Met Ser His Gln Asp Trp Gln Ala
 25 1 5 10 15

cag tgg aat cag 60
 Gln Trp Asn Gln
 20
 30

35 <210> 245
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 245
 Arg Ala Cys Gln Gly Asp Leu Gly Met Ser His Gln Asp Trp Gln Ala
 1 5 10 15
 40 Gln Trp Asn Gln
 20

45 <210> 246
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

50 <220>
 <221> CDS
 <222> (1)...(60)

<400> 246
 cat cag gac tgg cag gcc cag tgg aat cag gcc atg gag gct ctc gcg 48
 His Gln Asp Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Ala Leu Ala
 55 1 5 10 15

cgg gcc tac cgt
Arg Ala Tyr Arg
20

5

<210> 247
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

10

<400> 247
His Gln Asp Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Ala Leu Ala
1 5 10 15

15

Arg Ala Tyr Arg
20

20

<210> 248
<211> 60
<212> DNA
<213> Mycobacterium tuberculosis

25

<220>
<221> CDS
<222> (1)...(60)

<400> 248
gcc atg gag gct ctc gcg cgg gcc tac cgt cgg tgc cgg cga gca cta 48
Ala Met Glu Ala Leu Ala Arg Ala Tyr Arg Arg Cys Arg Arg Ala Leu
1 5 10 15

30

cgc cag atc ggg 60
Arg Gln Ile Gly
20

35

<210> 249
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

40

<400> 249
Ala Met Glu Ala Leu Ala Arg Ala Tyr Arg Arg Cys Arg Arg Ala Leu
1 5 10 15

45

Arg Gln Ile Gly
20

50

<210> 250
<211> 60
<212> DNA
<213> Mycobacterium tuberculosis

55

<220>
<221> CDS
<222> (1)...(60)

<400> 250

18 100

cgg tgc cgg cga gca cta cgc cag atc ggg gtg ctg gaa agg ccg gta 48
 Arg Cys Arg Arg Ala Leu Arg Gln Ile Gly Val Leu Glu Arg Pro Val
 1 5 10 15

5 ggc gat tcg tca 60
 Gly Asp Ser Ser
 20

10 <210> 251
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

15 <400> 251
 Arg Cys Arg Arg Ala Leu Arg Gln Ile Gly Val Leu Glu Arg Pro Val
 1 5 10 15
 Gly Asp Ser Ser
 20

20 <210> 252
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

25 <220>
 <221> CDS
 <222> (1) ... (60)

30 <400> 252 48
 gtg ctg gaa agg ccg gta ggc gat tcg tca gac tgc gga acg att agg
 Val Leu Glu Arg Pro Val Gly Asp Ser Ser Asp Cys Gly Thr Ile Arg
 1 5 10 15

35 gtg ggg tcg ttc 60
 Val Gly Ser Phe
 20

40 <210> 253
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

45 <400> 253
 Val Leu Glu Arg Pro Val Gly Asp Ser Ser Asp Cys Gly Thr Ile Arg
 1 5 10 15
 Val Gly Ser Phe
 20

50 <210> 254
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

55 <220>

<221> CDS

<222> (1)...(60)

<400> 254

5 gac tgc gga acg att agg gtg ggg tcg ttc cgg ggt cgg tgg ctg gac 48
 Asp Cys Gly Thr Ile Arg Val Gly Ser Phe Arg Gly Arg Trp Leu Asp
 1 5 10 15

10 ccg cgc cat gcg 60
 Pro Arg His Ala
 20

15 <210> 255
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

20 <400> 255
 Asp Cys Gly Thr Ile Arg Val Gly Ser Phe Arg Gly Arg Trp Leu Asp
 1 5 10 15
 Pro Arg His Ala
 20

25 <210> 256
 <211> 60
 <212> DNA
 <213> Mycobacterium tuberculosis

30 <220>
 <221> CDS
 <222> (1)...(60)

35 <400> 256
 cgg ggt cgg tgg ctg gac ccg cgc cat gcg ggt cca gcc acg gcc gcc 48
 Arg Gly Arg Trp Leu Asp Pro Arg His Ala Gly Pro Ala Thr Ala Ala
 1 5 10 15

40 gac gcc gga gac 60
 Asp Ala Gly Asp
 20

45 <210> 257
 <211> 20
 <212> PRT
 <213> Mycobacterium tuberculosis

50 <400> 257
 Arg Gly Arg Trp Leu Asp Pro Arg His Ala Gly Pro Ala Thr Ala Ala
 1 5 10 15
 Asp Ala Gly Asp
 20